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1 **Effects of ginger on disgust, sexual arousal and sexual engagement: A**
2 **placebo-controlled experiment**

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21 **Key Words:** Ginger, Sexual Arousal, Disgust, Sexual Dysfunction, Testosterone, Body Fluids,
22 Trait Characteristics

23
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28

29

1 **Effects of ginger on disgust, sexual arousal, and sexual engagement:**
2 **A placebo-controlled experiment**

3 **Abstract:**

4 Sexual problems are common complaints across countries and cultures, and behavioral
5 immune system theory suggests disgust plays an essential role in sexual functioning. The
6 current study investigated 1) if disgust induced by sexual body fluids would reduce sexual
7 arousal, reduce the likelihood of sexual engagement, and enhance disgust toward the
8 subsequent erotic stimuli, and 2) if the administration of ginger would affect these reactions.
9 We administered either ginger or placebo pills to a sample of 247 participants ($M_{\text{age}} = 21.59$,
10 $SD = 2.52$; 122 women) and asked them to complete either behavioral approach tasks with
11 sexual body fluids or with neutral fluids. Next, participants viewed and responded to
12 questions concerning erotic stimuli (nude and semi-nude pictures of opposite-sex models). As
13 expected, the sexual body fluids tasks induced disgust. The elevated disgust induced by
14 sexual body fluids tasks resulted in lower sexual arousal in women, whereas ginger
15 consumption counteracted this inhibiting effect of disgust on sexual arousal. Disgust elicited
16 by sexual body fluids also increased disgust toward the subsequent erotic stimuli. Ginger
17 increased sexual arousal toward the erotic stimuli in both men and women who had
18 completed the neutral fluids tasks. Findings provide further evidence of the role of disgust in
19 sexual problems, and, importantly, that ginger may improve the sexual function of individuals
20 via its sexual arousal-enhancing effect.

21
22 **Keywords:** Ginger, Sexual Arousal, Disgust, Sexual Difficulties, Body Fluids.

23

1 **Introduction**

2 Sexuality is an essential part of human beings and sexual problems are associated
3 with a series of negative outcomes, including depression, anxiety, personal distress, as
4 well as low well-being, and have negative effects on sexual and relationship
5 satisfaction in couples (Hendrickx et al., 2014; Laurent & Simons, 2009; McCabe &
6 Connaughton, 2017; Sanchez-Zarza et al., 2020). Lack of sexual desire is a common
7 sexual difficulty and the risk of low sexual desire increases as people age (Araujo et
8 al., 2004; Bacon et al., 2003; Khani et al., 2021). In fact, 30-50% of women (for a
9 recent review, see Khani et al., 2021) and 20-30% of men (Brotto et al., 2012;
10 Laumann et al., 2005; Mercer et al., 2003) report low sexual desire. However, when
11 the specific severity and duration diagnostic criteria from the Diagnostic and
12 Statistical Manual of Mental Disorders (DSM-5) are applied, the prevalence rates
13 markedly reduce (4.2%; Laumann et al., 2005; Mitchell et al., 2016). Given the
14 prevalence and the widespread negative impact of low sexual desire on individuals'
15 physical and psychological health, it is important to investigate the underlying factors
16 and find effective ways of restoring sexual function.

17 **Disgust and sexual function**

18 Disgust likely evolves as a behavioral immune system reaction to avoid contagion
19 risk (Crosby et al., 2019; Hlay et al., 2021; Koleva et al., 2012; Oaten et al., 2009).
20 However, maladapted disgust reactions are a potential cause of sexual problems
21 through decreasing individuals' sexual desire, sexual arousal, and increasing sexual
22 avoidance (Al-Shawaf et al., 2019; Crosby et al., 2019; Fleischman et al., 2015). In
23 fact, research has found an association between disgust and sexual problems,
24 especially in women (de Jong et al., 2013). For example, women with vaginismus
25 reported higher disgust propensity and increased disgust reactions to sexual stimuli

1 (e.g., automatic associations with disgust and enhanced subjective disgust; Borg et al.,
2 2010, 2011; de Jong et al., 2009).

3 Experimental investigations in non-clinical populations have also found that
4 disgust inhibited sexual arousal and increased avoidance of sexual stimuli. For
5 example, research has shown that disgust reduced the subjective feelings of sexual
6 arousal toward sexual stimuli (Fleischman et al., 2015), reduced objectively measured
7 genital sexual arousal (Andrews et al., 2015), and increased intentions to use condoms
8 (Tybur et al., 2011). Besides experimental manipulation of disgust, trait disgust
9 sensitivity, which has been divided into moral disgust, sexual disgust, and pathogen
10 disgust (Tybur et al., 2011), has also been found to be related to individuals' sexual
11 function. For example, studies have found that moral disgust and sexual disgust
12 suppressed potentially risky sexual behaviors such as not using condoms or having a
13 large number of sexual partners (Zhang et al., 2017), whereas core disgust sensitivity,
14 dispositional concerns about disease (Duncan et al., 2009; Olatunji et al., 2008), was
15 associated with risky sexual decision-making such as the willingness to have sex with
16 sex workers (Oaten et al., 2019).

17 The behavioral immune system theory suggests that sexual stimuli can induce
18 both sexual arousal and disgust, given that sexual intercourse includes exchanges of
19 body fluids such as saliva and semen that increase the likelihood of transmitting
20 infection (Ackerman et al., 2018; Crosby et al., 2019; de Jong et al., 2013; Stevenson
21 et al., 2011). The risk is particularly salient during sexual interactions, as the bodily
22 apertures involved in sexual interactions (such as the mouth or the vagina) present
23 high contamination risk (Rozin et al., 1995). According to de Jong et al. (2013), a
24 healthy sexual function loop occurs when sexual arousal outweighs disgust from
25 sexual stimuli and facilitates sexual approach behavior. In contrast, if individuals

1 experience higher disgust than sexual arousal, a sexually dysfunctional loop (disgust
2 inhibiting sexual arousal and increasing sexual avoidance behavior) can result.

3 However, although limited research has explored the association between disgust
4 and sexual arousal (Borg & de Jong, 2012; Borg et al., 2019; Stevenson et al., 2011),
5 the stimuli used to induce sexual disgust (pictures of scars on naked women,
6 disgusting odor containing elements similar to skunk odor, rotten garlic, and smelly
7 feet, or a behavioral approach task to lubricate a vibrator with one's own hands) do
8 not adequately match the contamination risk related to stimuli during actual sexual
9 encounters. Therefore, the first aim of this experiment was to test this hypothesis by
10 examining whether body fluids that specifically relate to sexual activity induce
11 feelings of disgust, which could in turn inhibit the sexual arousal toward and
12 willingness to sexually engage with subsequently presented erotic stimuli.

13 **Potential effect of ginger on sexual function**

14 As suggested by de Jong et al. (2013), a sexual dysfunction loop occurs when
15 disgust overwhelms sexual excitation. Hence, the down-regulation of disgust might be
16 a potentially effective pathway to prevent sexual problems from occurring. Several
17 studies have found that ginger can be used to reduce nausea (Marx et al., 2013, 2017;
18 Toth et al., 2018). Ginger can reduce both the incidence and severity of nausea and
19 vomiting during chemotherapy (Li et al., 2018; Thamlikitkul et al., 2017), in surgical
20 patients (Montazeri et al., 2013; Toth et al., 2018), in pregnant women (Lete & Allue,
21 2016) as well as in patients undergoing antiretroviral therapy (Dabaghzadeh et al.,
22 2014), but other evidence shows that the antiemetic effects of ginger are not
23 statistically significant compared to placebo (Li et al., 2018; Toth et al., 2018).
24 Additionally, research has also found that ginger can reduce psychological disgust as
25 well as subsequent moral condemnation (severity of participants' judgments of

1 moderately severe purity violations, e.g., “A man who is not in a romantic
2 relationship orders an inflatable sex doll that looks like his secretary”; Tracy et al.,
3 2019). Due to the suppressing effect of disgust on sexual arousal, we hypothesized
4 that ginger might reduce disgust toward sexual body fluids and toward the erotic
5 stimuli directly, thereby counteracting the inhibitory effects of disgust on sexual
6 arousal toward and willingness to sexually engage with subsequently presented erotic
7 stimuli.

8 Previous research on the effects of ginger on sexual function in humans is limited.
9 Only two studies have been conducted previously, one involving men with erectile
10 dysfunction and one involving women with decreased sexual desire. Specifically, the
11 first experimental study found that ginger consumption improved erectile function and
12 sexual satisfaction in older men with mild erectile dysfunction after 30-day treatment
13 with ginger (Stein et al., 2018). However, the lack of a placebo control group in this
14 study limits the conclusions that can be drawn. Shabanian et al. (2018) conducted a
15 placebo-controlled study to compare the effects of ginger, cinnamon, rose drops, and
16 placebo on the sexual function of depressed women with decreased sexual desire.
17 Results showed that compared with baseline, participants reported significant
18 improvements in desire, arousal, lubrication, orgasm, and satisfaction (five subscales
19 of the Female Sexual Function Index; Rosen et al., 2000) after treatment with ginger
20 for two months. Regarding the differences between ginger and placebo groups, the
21 improvement in desire and arousal (differences between baseline and scores after two
22 months of intervention) in the ginger group was higher than the placebo group.
23 However, women in the placebo group also had significant improvements in arousal
24 and showed non-significant improvements in lubrication ($p = .069$) and satisfaction (p
25 $= .054$) compared to baseline. This appears to provide evidence of efficacy for

1 secondary sexual problems given that depressed people are two to three times more
2 likely to develop sexual dysfunction than those without depression (Bonierbale et al.,
3 2003; Shabaniyan et al., 2018). Given that there are significant sex differences in
4 disgust and sexual arousal reactions (Crosby et al., 2021), as well as differences in
5 sexual desire level and sexual arousal patterns between men and women (Basson,
6 2002; Santtila et al., 2008), placebo-controlled experiments recruiting both men and
7 women without health problems or healthy people with sexual complaints are needed
8 to further explore the effect of ginger on sexual function and compare the treatment
9 effect of ginger in men and women.

10 **Moderation of the effects of sexual body fluids by sex and ginger**

11 We also expected that sex and ginger could moderate the effects of sexual body
12 fluids on the feelings toward subsequent erotic stimuli. According to the sexual
13 function loop model suggested by de Jong et al. (2013), disgust propensity and sexual
14 excitability moderate the strength of sexual arousal and disgust toward sexual stimuli.
15 Due to differences in minimum obligatory costs of parental investment between men
16 and women (Bjorklund & Kipp, 1996; Trivers, 1972) as well as women's higher
17 likelihood of being infected by a sexually transmitted infection (Coombs et al., 2003;
18 Panchanadeswaran et al., 2006), and of being sexually assaulted (Schou-Bredal et al.,
19 2022), women are expected to display higher disgust sensitivity, higher sexual
20 inhibition, and lower sexual excitation (Crosby et al., 2021). Previous studies have
21 found that men scored higher on measures of sexual excitation and lower on measures
22 of sexual inhibition compared to women, while women reported higher disgust
23 sensitivity and disgust propensity compared to men (Crosby et al., 2021). Therefore,
24 we expected that women would experience more disgust from sexual body fluids than
25 men, and that the inhibiting effect of sexual body fluids on sexual arousal toward and

1 willingness to sexually engage with subsequent erotic stimuli would be stronger in
2 women than in men. Given that ginger was expected to reduce feelings of disgust
3 toward sexual body fluids, we hypothesized that ginger would reduce feelings of
4 disgust induced by sexual body fluids, thereby attenuating the inhibiting effects of
5 sexual body fluids on sexual arousal toward and willingness to sexually engage with
6 subsequently presented erotic stimuli.

7 **The Current Study**

8 Our main hypotheses were as follows:

9 H1: Exposing participants to sexual body fluids will result in feelings of disgust.
10 This disgust-eliciting effect of sexual body fluids will be stronger in women than in
11 men.

12 H1b: Ginger will attenuate this disgust-eliciting effect of sexual body fluids, with
13 the effect being weaker in those who consumed ginger than those who consumed
14 placebo.

15 H2: Exposing participants to sexual body fluids will also result in feelings of
16 sexual arousal. This sexual arousal-eliciting effect of sexual body fluids will be
17 stronger in men than in women.

18 H2b: Ginger will enhance this sexual arousal-eliciting effect of sexual body fluids,
19 with the effect being stronger in those who consumed ginger than those who
20 consumed placebo.

21 H3: Sexual arousal elicited by erotic stimuli and willingness to sexually engage
22 with the persons in erotic stimuli will be reduced if preceded by exposure to sexual
23 body fluids. This inhibiting effect of sexual body fluids will be stronger in women
24 than in men.

25 H3b: Ginger will attenuate this inhibiting effect of sexual body fluids, with the

1 effect being weaker in those who consumed ginger than those who consumed placebo.

2 H4: The level of disgust elicited by erotic stimuli will be increased if preceded by
3 exposure to sexual body fluids. This disgust-eliciting effect of sexual body fluids will
4 be stronger in women than in men.

5 H5: Finally, ginger will also directly increase sexual arousal, increase the
6 likelihood of sexual engagement, and directly decrease disgust elicited by erotic
7 stimuli.

8 **Method**

9 *Participants*

10 The final sample included 247 Chinese participants (125 men) with a mean age of
11 21.59 ± 2.52 recruited at East China Normal University and through social media (e.g.,
12 QQ, WeChat). Other background information is presented in Table 1.

13 **[Table 1 near here]**

14 The inclusion criteria were: 1) older than 18; 2) Chinese (nationality); 3)
15 heterosexual; 4) not a psychology student/researcher; 5) not pregnant or currently
16 breastfeeding; 6) have eaten ginger before and have no allergy against ginger; 7) no
17 Rhinitis, nasosinusitis or other illness that has those symptoms, such as fever, cough,
18 and others; 8) without severe physical or mental illness (e.g., hepatic and renal
19 dysfunction, anemia or diabetes). Four participants who participated in the lab
20 experiment did not answer the online questionnaire the next day. Data from twelve
21 participants who reported being heterosexual in the screening test but reported their
22 orientation as non-heterosexual in the online questionnaire were removed.

23 *Materials and measures*

24 *Study edibles:*

25 Ginger: Ginger powder in gelatin-coated capsules with a total dose of 1500mg

1 ginger was administered to the participants in the experimental group to attain the
2 anti-emetic effect (Tracy et al., 2019).

3 Calcium: An equivalent dose of 1500mg calcium in capsules was administered to
4 the participants in the placebo group.

5 ***Erotic stimuli material***

6 The erotic stimuli consisted of eight 1-minute erotic videos (four videos
7 presenting static pictures of nude and semi-nude Asian male models for female
8 participants and four videos presenting static pictures of nude and semi-nude Asian
9 female models for male participants). Each video included 15 pictures (seven or eight
10 were pictures of nude models) and each picture was presented for 4 seconds.

11 The pictures used were derived from a Chinese erotic picture database and have
12 been shown to successfully induce feelings of sexual arousal in Chinese populations
13 (Cui et al., 2020). We selected 120 sexually arousing pictures randomly from this
14 database (60 nude models and 60 semi-nude models). The usage of the pictures was
15 approved by the owner.

16 ***Behavioral Approach Tasks***

17 A behavioral approach task paradigm was used to induce sexuality-related disgust.
18 To induce these feelings, we created four behavioral tasks that the participants in the
19 sexual body fluids group were asked to carry out. The tasks ostensibly involved body
20 fluids related to sexual activities, including sweat (sweat from the head and neck),
21 saliva, body odor (sweat from an armpit), semen (only for female participants), and
22 vaginal secretions (only for male participants). Participants were asked to smell and
23 touch the body fluids of the opposite sex while wearing plastic gloves.

24 The four ostensibly disgusting body fluids were all fake. Specifically, sweat and
25 body odor used the same fluids but with different labels. They were made of a mixture

1 of water and an odorless, watery, and yellowish skin care product. We placed a few
2 drops of this mixture on the surface of a cotton ball. Water was used for fake saliva.
3 We used a plastic spray bottle to spray the water into the dish so that this fake saliva
4 would include small bubbles, thus making it appear more realistic. Semen-like
5 lubricant (white) gel, used frequently in adult videos, was used to achieve the effect of
6 fake semen, while colorless and transparent lubricant was used for vaginal secretions.
7 All these stimuli were put in a dish with a label, indicating the type of fluid. In
8 contrast, four neutral fluids (sweet water, saline water, soda water, and water) were
9 used for participants in the control group. These four neutral fluids were real.

10 Each task included three steps with the participant being asked to 1) Observe the
11 fluid in the dish; 2) Lift the dish and smell the fluid; and 3) Touch the fluid using their
12 finger (while wearing a plastic glove). After finishing each task, the PANAS-R was
13 used to assess participants' feelings (see Measures).

14 ***Introductory videos for fluids in behavior approach tasks***

15 For each fluid in the tasks, we recruited two research assistants (a man and a
16 woman) to record two 30-second introductory videos to introduce fake information
17 concerning how we acquired the fluids (<https://osf.io/89m2k/>). The content of each of
18 the two videos was the same, the only difference being the gender of the research
19 assistant in the videos. We presented the female version of the videos (recorded by a
20 female research assistant) to the male participants, while we showed the male version
21 of the videos (recorded by a male research assistant) to the female participants.

22 For the introductory videos of sweat, we recorded the process where the assistants
23 wiped the sweat on their forehead, face, and neck using a cotton ball and put the ball
24 into a dish. For the introductory videos of body odors, the assistants put the cotton
25 ball under their armpit and took it out after 15 seconds (we informed the participants

1 in writing that the cotton ball had been placed under the armpit for 5 minutes) and
2 then placed it in a dish. Semen and vaginal secretions (lubricant) were put in a
3 medical sterile sampling cup. In the introductory video for the semen sample, the
4 video displayed a research assistant who pipetted and dropped a sample of “semen”
5 from a sterile sampling cup into a dish. In the video for vaginal secretions sample, the
6 video displayed a research assistant who took the secretions out of the medical sterile
7 sampling cup using a cotton swab.

8 As for the water and soda water, we recorded the assistants pouring some water or
9 soda water into a beaker and then dropping small amounts of water/soda water into
10 the dish via dropper. Regarding the saline water and sweet water, the videos included
11 the assistants pouring salt or sugar as well as water into the beaker, and dropping
12 some mixtures into the dish after stirring well via a glass rod.

13 **Neutral stimuli**

14 Three BBC movies were selected (Snow Bears; Wonders of the Moon; Earth from
15 Space) and participants would watch these films randomly when they were waiting
16 for the administered treatment to take effect. *Snow Bears* presents a migration journey
17 of polar bear cubs and their mother; *Wonders of the Moon* shows detailed images of
18 the moon and gives descriptions on how it shapes life on Earth. *Earth from Space* tells
19 stories of life on Earth from a new perspective using cameras in space.

20 **Measures**

21 Background information questions included sex, age, relationship status, sexual
22 orientation, education, occupation, relationship length, monthly income, general
23 physical health, and the lifetime number of sexual partners (see Table 1 for response
24 options).

25 *Positive and Negative Affect Schedule-Revised (The PANAS-R; Watson et al.,*

1 1988)

2 The PANAS-R is a self-report questionnaire that consists of two 10-item scales to
3 measure both positive and negative affects. Each item is rated on a 5-point scale of 1
4 (not at all) to 5 (very much). To measure participants' affects after viewing the videos
5 and completing the behavior approach tasks, we selected 9 items (including 4 positive
6 items, 4 negative items, and 1 neutral item) from the PANAS and added two
7 additional items (disgusting, sexually arousing). Only items measuring disgust and
8 sexual arousal after completing the behavior approach tasks and viewing the erotic
9 stimuli were used in the data analysis, while measurement of other items was used to
10 disguise our experiment's purpose.

11 *Likelihood of sexual engagement*

12 After viewing the erotic stimuli, the participants had to mark their intention on a
13 graphic slider that ranged from 0 (not at all) to 10 (very) to indicate their likelihood of
14 sexual engagement ("If now an attractive opposite-sex you met in the videos wants to
15 have sex with you, how likely are you to accept this invitation?").

16 *Measures of trait characteristics*

17 The Sexual Desire Inventory developed by Spector et al. (SDI; 1996) was used to
18 measure people's dyadic ($\alpha = .90$) and solitary ($\alpha = .78$) sexual desire. The Sexual
19 Inhibition/Sexual Excitation Scales – Short Form (SIS/SES-SF; Janssen et al., 2020)
20 was used to measure participants' sexual inhibition 1 (Inhibition because of the threat
21 of performance failure; $\alpha = .29$), sexual inhibition 2 (Inhibition because of the threat
22 of performance consequences; $\alpha = .62$), and sexual excitation ($\alpha = .80$).

23 The Disgust Propensity and Disgust Sensitivity Scale (DPDSS; van Overveld et
24 al., 2006) was used to measure the disgust propensity ($\alpha = .78$) and disgust sensitivity
25 ($\alpha = .74$) of participants. The Three-Domain Disgust Scale (TDDS; Tybur et al., 2009)

1 was used to measure participants' pathogen disgust ($\alpha = .68$), sexual disgust ($\alpha = .82$),
2 and moral disgust ($\alpha = .75$). The Disgust Scale-Revised (DS-R; Olatunji et al., 2007)
3 was used to measure individual differences in disgust sensitivity ($\alpha = .78$).

4 ***Procedure***

5 The study was advertised as an experiment exploring the effects of different food
6 on individuals' emotions. The potential participants needed to answer a survey that
7 we used to assess their eligibility. In addition, to avoid any unexpected affects, the
8 participants were asked not to drink/take alcohol, coffee, or other drugs and not to
9 have masturbated or engaged in any other sexual activities for at least 12 hours before
10 the experiment. Eligible participants were informed about the nature of the tasks
11 (taking 1.5g of one of the fifteen food items and finishing the behavior approach tasks)
12 and questionnaires they needed to complete.

13 The experiment took place in a quiet lab with a public working area and two small
14 rooms. These two small rooms were equipped with computers and were used for the
15 formal experiment. The lab is close to the East China Normal University hospital and
16 all the research assistants as well as experimenters received CPR (cardiopulmonary
17 resuscitation) training to avoid any unwanted health risks (e.g., allergic reactions
18 against ginger).

19 After reading and signing the consent form, participants were assigned a
20 participation ID and were administered the ginger pills or placebos randomly. This
21 was a double-blind experiment. Ginger pills and placebo were put in two different
22 bottles with different labels ("N.2" and "N.3") assigned by a person not involved in
23 this experiment. Microsoft Excel created a random number for each participant, with
24 participants having even numbers taking the pills in the bottle labelled "N.2" (ginger).
25 Previous studies regarding the absorption of ginger as well as ginger's efficacy on

1 nausea reduction suggested a delay of 30 min to 1 hour before testing its efficacy
2 (Jiang et al., 2008; Lien et al., 2003; Tracy et al., 2019). To allow the ginger pills to
3 be absorbed completely, each participant was asked to have a rest for 1 hour after
4 taking the pills. During this rest time, they were asked to watch a sample video
5 showing the process of the later formal experiment (around 10 mins) and a BBC
6 movie (around 50 mins).

7 One hour later after taking the pills, the participants went back to the lab and
8 started the formal experiment. There were eight dishes and a laptop on the table in
9 each small room. Four dishes held the neutral fluids and had labels with numbers
10 (1~4), while the other four dishes held body fluids and had labels with letters (A~D).

11 All the processes in the lab were presented via *Qualtrics*© software
12 (www.qualtrics.com). The participants answered two background questions recording
13 their assigned participation ID and the label of the pills (“N.2” or “N.3”) they had
14 eaten and then were assigned to the sexual body fluids tasks group or the neutral
15 fluids tasks group randomly by *Qualtrics*. Next, the participants were asked to finish
16 the corresponding four behavioral tasks in their group one by one.

17 For each behavioral task, the participants were first asked to complete the
18 PANAS-R measuring their baseline emotion, and then they were informed of the type
19 of the fluid in this round and viewed the introductory video for the corresponding
20 fluid (e.g., “In this round, you need to smell and touch water; now watch the video
21 below and learn how we get this fluid”). Then, they were informed to open the
22 corresponding dish and complete the task (e.g., “The dish with label “N.1” held water,
23 now please uncover the dish and finish the following tasks: 1) pick up the dish and
24 observe; 2) move the dish close to your nose and smell the fluid; 3) put the dish down,
25 wear a plastic glove and touch the fluid with your finger; 4) now please put the dish

1 back and take off the glove”). After touching the fluid, they were asked to complete
2 the PANAS-R again to measure their disgust and sexual arousal after receiving our
3 manipulation. They were then asked to view a 1-min erotic stimulus aimed at eliciting
4 sexual arousal. After viewing the erotic stimuli, they needed to answer the PANAS-R
5 again as well as a one-item scale measuring their likelihood of sexual engagement. In
6 short, participants needed to complete one behavioral approach task and then view
7 one erotic stimulus in each behavior task. A flowchart of the experiment is presented
8 in Figure 1.

9 **[Figure 1 near here]**

10 Following this, all tasks in the lab were over and the participants were asked to
11 complete an online survey measuring their trait characters via *Wenjuanxing*
12 (www.wjx.cn; a popular Chinese online survey website) the next day. At the end of
13 the survey, we debriefed the participants and explained the purpose of the study and
14 the deception used.

15 ***Data analyses***

16 All data analyses using simple mixed linear model were conducted in IBM SPSS
17 v25.0. In these mixed linear models, participants’ IDs were used as Subjects variables
18 and the different task types were used as Repeated variables. Random factors
19 measuring individual differences including trait characteristics were not included in
20 these models because we ran the exploratory moderation analyses to explore if and
21 how trait characteristics affect the effects of ginger. Bonferroni corrections were used
22 for multiple comparisons in mixed linear models and *p*-values less than .05 indicated
23 a nominal significance.

24 A series of 2 (Task type: Sexual body fluids tasks vs. Neutral fluids tasks) x 2
25 (Ginger: Yes vs. No) x 2 (Sex: Women vs. Men) mixed linear models were conducted

1 to explore 1) if the sexual body fluids tasks successfully induced feelings of disgust
2 and if sex and ginger would moderate this disgust-eliciting effect of sexual body
3 fluids tasks, 2) if the sexual body fluids tasks also induced feelings of sexual arousal
4 and if sex and ginger would moderate this sexual arousal-eliciting effect of sexual
5 body fluids tasks, 3) if the sexual body fluids tasks would inhibit feelings of sexual
6 arousal and the likelihood of sexual engagement toward the subsequent erotic stimuli
7 and if sex and ginger would moderate this inhibiting effect of sexual body fluids tasks,
8 4) if the sexual body fluids tasks would enhance feelings of disgust toward subsequent
9 erotic stimuli and if sex would moderate this disgust-enhancing effect of sexual body
10 fluids tasks.

11 The sexual body fluids tasks were expected to affect feelings and reactions toward
12 subsequent erotic stimuli. To eliminate the effects of sexual body fluids tasks on
13 feelings and reactions toward the erotic stimuli, a series of 2 (Ginger: Yes vs. No) x 2
14 (Sex: Women vs. Men) mixed linear models restricting the data only to participants
15 who completed the neutral fluids tasks were conducted to explore if ginger would
16 increase sexual arousal, increase the likelihood of sexual engagement, and directly
17 decrease disgust elicited by erotic stimuli and if sex would moderate the effect of
18 ginger.

19 *Ethical approval and pre-registration*

20 The current study received approval from the Institutional Review Board of New
21 York University Shanghai (Approval Number is 2021-019-NYUSH-Zhongbei).
22 Before the data collection began, a pre-registration was submitted to
23 ASPREDICTED.COM (<https://aspredicted.org/ci59t.pdf>).

24 **Results**

25 **Attrition**

1 None of the participants dropped out of the experiment.

2 **H1: Do sexual body fluids induce feelings of disgust?**

3 Table 2 presents the means and standard deviations of feelings and reactions
4 toward the fluids tasks and the erotic stimuli grouped by task type (Sexual body fluids
5 tasks vs. Neutral fluids tasks), ginger (Yes vs. No), and sex (Men vs. Women).

6 [Table 2 near here]

7 Table 3 presents the effects of task type and the moderating effects of sex and
8 ginger from the mixed linear models.

9 [Table 3 near here]

10 There was a main effect of task type on feelings of disgust toward the fluids tasks
11 ($p < .001$). Participants who completed the sexual body fluids tasks reported more
12 disgust than those who completed the neutral fluids tasks. This was in line with our
13 Hypothesis 1.

14 There was also a significant interaction between sex and task type on feelings of
15 disgust ($p < .001$), which was in line with Hypothesis 1. Post hoc analyses showed
16 that both men ($p < .001$) and women ($p < .001$) who completed the sexual body fluids
17 tasks reported more disgust than those who completed the neutral fluids tasks.

18 However, women who completed the sexual body fluids tasks reported more disgust
19 than men who completed the sexual body fluids tasks ($p < .001$), while there was no
20 sex difference among participants who completed the neutral fluids tasks ($p = .629$).

21 **H1b: Does ginger attenuate this disgust-eliciting effect of sexual body fluids?**

22 There was no interaction between task type and ginger ($p = .893$) or between task
23 type, ginger, and sex ($p = .325$) on feelings of disgust, which did not support
24 Hypothesis 1b.

25 **H2: Do sexual body fluids induce feelings of sexual arousal?**

1 There was also a main effect of task type ($p = .002$) and a significant interaction
2 between task type and sex ($p < .001$) on feelings of sexual arousal toward the fluids
3 tasks, supporting Hypothesis 2. Men who completed the sexual body fluids tasks
4 reported stronger sexual arousal than men who completed the neutral fluids tasks (p
5 $< .001$), while there was no task type difference in women ($p = .723$).

6 **H2b: Does ginger enhance this sexual arousal-eliciting effect of sexual body**
7 **fluids?**

8 There were significant interactions between task type and ginger ($p = .036$), and
9 between task type, ginger, and sex ($p = .007$). Men who completed the sexual body
10 fluids tasks reported stronger sexual arousal than men who completed the neutral
11 fluids tasks ($p < .001$) in the ginger group, while there was no task type difference in
12 men who consumed the placebo ($p = .368$). There was no task type difference in
13 women who consumed the ginger ($p = .575$) or the placebo ($p = .961$).

14 **H3: Do sexual body fluids inhibit feelings of sexual arousal and the likelihood of**
15 **sexual engagement toward the subsequent erotic stimuli?**

16 *H3.1 Do sexual body fluids inhibit feelings of sexual arousal toward the erotic*
17 *stimuli?*

18 There was no main effect of task type on feelings of sexual arousal ($p = .097$) or
19 interaction between task type and sex ($p = .142$), which did not support Hypothesis 3,
20 although the means were in the expected direction. Participants who completed the
21 sexual body fluids tasks showed a non-significant tendency to report weaker sexual
22 arousal than those who completed the neutral fluids tasks.

23 *H3.1b Does ginger attenuate this inhibiting effect of sexual body fluids on sexual*
24 *arousal toward the erotic stimuli?*

25 There was no significant interaction between task type and ginger ($p = .405$),

1 whereas there was a significant interaction between task type, ginger, and sex (p
2 = .036), supporting Hypothesis H3b. Post hoc analyses showed that women who
3 completed the sexual body fluids tasks reported weaker sexual arousal toward the
4 erotic stimuli than women who completed the neutral fluids tasks ($p = .032$; see
5 Figure 2) in the placebo group, whereas there was no task type difference in women
6 who consumed ginger ($p = .345$). There was no task type difference in men who
7 consumed the placebo ($p = .167$) or ginger ($p = .118$).

8 **[Figure 2 near here]**

9 ***H3.2 Do sexual body fluids inhibit the likelihood of sexual engagement toward the***
10 ***erotic stimuli?***

11 There was no main effect of task type on the likelihood of sexual engagement with
12 the subsequent erotic stimuli ($p = .404$) or significant interaction between task type
13 and sex ($p = .562$), which did not support Hypothesis 3.

14 ***H3.2b Does ginger attenuate this inhibiting effect of sexual body fluids on the***
15 ***likelihood of sexual engagement toward the erotic stimuli?***

16 There was no significant interaction between task type and ginger ($p = .319$),
17 whereas there was a significant interaction between task type, ginger, and sex (p
18 < .001). Post hoc analyses showed that women who completed the sexual body fluids
19 tasks reported higher likelihood of sexual engagement than women who completed
20 the neutral fluids tasks ($p = .002$; see Figure 3) in the ginger group, whereas there was
21 no task type difference in women who consumed the placebo ($p = .114$). There was no
22 task type difference in men who consumed the placebo ($p = .141$) or ginger ($p = .228$).

23 **[Figure 3 near here]**

24 **H4: Do sexual body fluids enhance feelings of disgust toward the erotic stimuli?**

25 There was a main effect of task type on feelings of disgust toward the erotic

1 stimuli ($p = .001$), which supported Hypothesis 4. Participants who completed the
2 sexual body fluids tasks reported more disgust than those who completed the neutral
3 fluids tasks.

4 There was no significant interaction between task type and sex ($p = .101$),
5 between task type and ginger ($p = .731$), or between task type, ginger, and sex (p
6 = $.607$) on feelings of disgust toward the erotic stimuli.

7 **H5: Does ginger affect feelings and reactions toward the subsequent erotic**
8 **stimuli?**

9 Table 4 presents the effects of ginger and the moderating effects of sex on feelings
10 toward the erotic stimuli from the mixed linear models.

11 **[Table 4 near here]**

12 There was a main effect of ginger on feelings of sexual arousal toward the erotic
13 stimuli ($p = .04$), which was in line with Hypothesis 5. Participants who consumed
14 ginger reported stronger feelings of sexual arousal than those who consumed placebo
15 (see Figure 4). There was no significant interaction between ginger and sex ($p = .293$).

16 There was no main effect of ginger or interaction between ginger and sex on the
17 likelihood of sexual engagement ($p = .719$; $p = .122$) or disgust ($p = .230$; $p = .145$)
18 toward the erotic stimuli.

19 **[Figure 4 near here]**

20 **Discussion**

21 We employed a novel paradigm using (fake) sexual body fluids encountered
22 during sexual activities to explore if increases in feelings of disgust induced by such
23 fluids could decrease feelings of sexual arousal, decrease the likelihood of sexual
24 engagement, and increase disgust toward subsequent erotic stimuli. We also
25 investigated whether sex and administration of ginger could moderate these effects of

1 task type. Exploratory analyses were conducted to explore if ginger could affect
2 feelings and reactions toward the erotic stimuli.

3 **Disgust and sexual arousal induced by sexual body fluids**

4 Participants who completed the sexual body fluids tasks reported higher levels of
5 disgust, which was consistent with our expectations. The exchange of sexual body
6 fluids (e.g., saliva, sweat, semen, and vaginal fluids) carries contagion risk which
7 might activate the behavioral immune system, increasing feelings of disgust to
8 activate avoidance (Crosby et al., 2019; Stevenson et al., 2011). Sexual body fluids
9 are also perceived as powerful disgust elicitors in non-sex-related situations (Borg &
10 de Jong, 2012; Rozin et al., 1995). We found that this manipulation requiring the
11 participants to smell and touch the sexual body fluids also induced feelings of sexual
12 arousal in men. These results were in line with the behavioral immune system theory,
13 suggesting that sexual stimuli can induce both disgust and sexual arousal (Crosby et
14 al., 2019; de Jong et al., 2013).

15 **The effect of sexual body fluids on subsequent sexual arousal and the likelihood** 16 **of sexual engagement**

17 Although disgust induced by sexual body fluids did not reduce feelings of sexual
18 arousal and the likelihood of sexual engagement toward the erotic stimuli as we had
19 expected, we did find that participants who completed the sexual body fluids task
20 reported non-significantly weaker sexual arousal toward the erotic stimuli compared
21 to those who completed the neutral fluid tasks ($p = .097$). The lack of significant
22 findings are surprising given that a series of studies have shown that sexual arousal
23 and disgust have a strong negative relationship with up-regulated disgust, inhibiting
24 sexual arousal and increasing sexual avoidance behavior toward sexual stimuli
25 (Andrews et al., 2015; Borg & de Jong, 2012; Fleischman et al., 2015). Research has

1 found that women report less sexual arousal toward erotic stimuli if they have first
2 been exposed to disgusting pictures (Fleischman et al., 2015) and men also have a
3 lowered genital sexual arousal response after having been exposed to a highly
4 disgusting odor (Borg et al., 2019). One possible explanation for this failure would be
5 that the intensity of disgust induced by sexual body fluids was not strong enough to
6 down-regulate the sexual arousal toward the erotic stimuli.

7 We also found that sex and ginger moderated the effect of task type on feelings of
8 sexual arousal toward the erotic stimuli. Women who completed the sexual body
9 fluids tasks reported weaker sexual arousal than women who completed the neutral
10 fluids task in the placebo group, as we had expected, whereas in women who
11 consumed ginger there was no task type difference. Contrary to our hypothesis, we
12 found that in the ginger group, women who completed the sexual body fluids tasks
13 reported higher likelihood of sexual engagement compared to women who completed
14 the neutral fluids tasks, while in the placebo group there was no task type difference
15 in women. These findings indicated that ginger might affect the effect of sexual body
16 fluids on sexual arousal and the likelihood of sexual engagement toward the erotic
17 stimuli. Given that there was no effect of ginger on feelings of disgust or sexual
18 arousal toward the sexual body fluids in either women or men, the possible
19 mechanism still remains unclear but it could possibly be that ginger affected the
20 process where disgust affected feelings and reactions toward the erotic stimuli rather
21 than directly decreasing experienced disgust induced by sexual body fluids.

22 In addition, sexual body fluids failed to affect the feelings of sexual arousal or
23 likelihood of sexual engagement toward erotic stimuli in men who consumed the
24 ginger or the placebo; sex differences in feelings toward sexual body fluids may be
25 one of the possible reasons. Parental investment theory suggests that when choosing

1 their potential partner, the sex that invests more in their offspring would be more
2 selective because of the higher potential costs from sexual activity (Bjorklund & Kipp,
3 1996; Trivers, 1972). As a result, women may have developed higher disgust and
4 sexually inhibiting tendencies, while men may have developed more sensitive
5 reactions to sexual stimuli. In line with this, men were more likely to experience
6 higher sexual arousal and lower disgust when exposed to sexual body fluids. We
7 found that women experienced only increased feelings of disgust toward sexual body
8 fluids, whereas men experienced both sexual arousal and disgust toward sexual body
9 fluids, which both would have an impact on feelings and reactions toward subsequent
10 erotic stimuli.

11 Another reason why the effects of task type on men and women differed may be
12 that the erotic stimuli used for men and women in the current study were different.
13 Moderation by sex on erotic stimuli could be an artifact as a result of the different
14 stimuli sets, which limits the conclusions about sex differences that can be drawn.

15 **The effect of sexual body fluids on subsequent disgust toward erotic stimuli**

16 Results showed that participants who completed the sexual body fluids tasks
17 reported more disgust toward the erotic stimuli than those who completed the neutral
18 fluids tasks. The increase in disgust toward the erotic stimuli after receiving disgust
19 manipulation may indicate how the negative relationship between sexual arousal and
20 disgust works. Disgust induced by sexual body fluids increased feelings of disgust
21 toward the erotic stimuli, acting as a priming disgusting cue or the accumulative effect
22 of disgust from sexual body fluids to the erotic stimuli. This increase in disgust
23 toward the erotic stimuli would reduce sexual arousal toward the erotic stimuli. In
24 other words, disgust caused by sexual body fluids could not only interfere with
25 feelings of sexual arousal toward the erotic stimuli directly, but it could also reduce

1 sexual arousal indirectly via the mediating effect of disgust toward the erotic stimuli.
2 A corresponding pattern should exist when exploring the inhibiting effect of sexual
3 arousal on sex-related disgust. Specifically, sexual arousal induced by erotic stimuli
4 would be expected to increase feelings of sexual arousal toward sexually disgusting
5 stimuli because, similar to a priming effect, the prior sexual arousal would allow
6 people to extract sex-relevant information rapidly and easily. This increase in sexual
7 arousal toward the sexually disgusting stimuli would then reduce disgust toward the
8 sexually disgusting stimuli.

9 **The effect of ginger on feelings and reactions toward the erotic stimuli**

10 As expected, we found that ginger increased the feelings of sexual arousal toward
11 the erotic stimuli in both men and women who completed the neutral fluids tasks.
12 These findings were consistent with previous evidence suggesting that consumption
13 of ginger may have a positive effect on human sexual function, including
14 improvement in self-reported erectile function and intercourse satisfaction in older
15 men (Stein et al., 2018) and better sexual function in depressed women with low
16 sexual desire (Shabanian et al., 2018). However, ginger did not reduce feelings of
17 disgust toward sexual body fluids or decreased disgust toward the erotic stimuli,
18 which was not in line with our hypotheses. Although post hoc analyses showed that
19 women who consumed ginger showed a non-significant tendency to report less
20 disgust toward erotic stimuli than women who consumed placebo ($p = .06$), this
21 decrease in disgust might be due to the disgust-inhibiting effects of elevated sexual
22 arousal caused by ginger consumption.

23 The mechanism of the effects of ginger on sexual function has not yet been
24 investigated systematically. Previous evidence has shown that ginger can reduce
25 physical vomiting and nausea as well as subjective feelings of disgust in humans (Li

1 et al., 2018; Thamlikitkul et al., 2017; Tracy et al., 2019). Thus, the consumption of
2 ginger was expected to reduce disgust elicited by sexual body fluids and erotic stimuli,
3 thereby increasing sexual arousal and sexual behaviors (D model). However, in
4 contrast to our hypothesis, ginger had no effect on feelings of disgust toward the
5 erotic stimuli (only a non-significant reduction in women) and sexual body fluids.
6 One possible reason was that ginger acts on disgust in ways that are not reflected in
7 the conscious experience of disgust. Ginger has been proven to be an effective
8 antiemetic and could directly suppress physical nausea and vomiting by interfering
9 with the 5-HT₃ signaling pathway and inhibiting activation of human 5-HT_{3A} and 5-
10 HT_{3AB} receptors (resulting in physical nausea and vomiting; Marx et al., 2015; Toth
11 et al., 2018; Walstab et al., 2013), which may, in turn, decrease subjective feelings of
12 disgust indirectly.

13 Given the increase in sexual arousal toward the erotic stimuli as well as the lack of
14 change in disgust, a more probable mechanism would be that ginger increased sexual
15 arousal and sexual behaviors via its enhancing effects on testosterone, which then
16 inhibited the feelings of disgust during sexual activities due to the negative interaction
17 between sexual arousal and disgust. Testosterone has been associated with
18 individuals' sexual behaviors, and it has been suggested that testosterone could
19 improve men's and women's sexual desire, sexual behaviors, and sexual functions (de
20 Jong et al., 2013; Lunenfeld et al., 2015; Panay et al., 2010). Despite the fact that the
21 impact of ginger on testosterone has not been confirmed in humans, empirical
22 evidence has found a robust effect of ginger on testosterone in non-human mammals
23 (Banihani, 2018), which suggests the possibility of ginger's effect on human sexuality
24 via its enhancing effects on testosterone. However, we did not measure testosterone in
25 the current study and therefore further investigation regarding the effect of ginger on

1 testosterone in humans is needed.

2 Another reason why the effects of ginger were weak could be that participants
3 with sexual problems would benefit more from ginger compared to healthy
4 participants without sexual problems. The only two experiments focusing on the
5 effects of ginger on sexual functioning were conducted in men aged 50-68 years with
6 mild erectile dysfunction (Stein et al., 2018) and depressed women with decreased
7 sexual desire (Shabanian et al., 2018). Our exploratory analyses (see non-peer-
8 reviewed Appendix A in the online supplementary material; <https://osf.io/89m2k/>)
9 showed that participants with vulnerable traits (high disgust propensity and disgust
10 sensitivity and low sexual desire), which were closely related to sexual problems
11 (Crosby et al., 2019; de Jong et al., 2013; Nowosielski et al., 2021; Quinta-Gomes et
12 al., 2021), who consumed ginger were more likely to report less disgust, stronger
13 sexual arousal, and a higher likelihood of sexual engagement toward the erotic stimuli
14 compared to participants who consumed the placebo. However, the lack of
15 recruitment of participants with sexual problems in this study means that further
16 research is needed.

17 **Strengths and Limitations**

18 The current experiment is the first to have used sex-related body fluids as disgust-
19 inducing stimuli to explore the suppressing effect of disgust on sexual arousal. We
20 also measured both sexual arousal and disgust for disgust elicitors and erotic stimuli.
21 This allowed us to explore how sexual arousal and disgust interact. In addition, the
22 placebo-controlled design in healthy men and women also overcomes the limitations
23 of previous studies. Further, we advanced two possible pathways on how ginger
24 affects sexual behaviors and functioning of individuals.

25 The present study had some limitations. First, all participants in our experiment

1 were heterosexual, and most of them were university students, which limits our ability
2 to generalize the findings to other populations. Future experiments should include
3 participants with a wider range of ages and sexual orientations. Second, the sexual
4 body fluids we used were fake. The authenticity of the body fluids may have been
5 doubted by some participants, which may have reduced the effectiveness of the
6 manipulation. Further experiments should investigate whether the participants believe
7 the sexual body fluids in the tasks are real. Also, this was a repeated measurement
8 design in which participants completed the tasks one by one. The feelings of sexual
9 arousal toward the erotic stimuli from a prior trial could affect feelings of disgust
10 toward the sexual body fluids in the next trial. Moreover, due to restrictions on the use
11 of sexual stimuli in China, the erotic stimuli we used only presented nude and semi-
12 nude pictures of models, which might not induce sexual arousal in all participants. In
13 addition, men and women watched different erotic stimuli, which makes the
14 interpretation of sex differences in feelings toward the erotic stimuli difficult. Future
15 experiments should consider using the same set and more sexually explicit stimuli
16 across sexes.

17 **Conclusion**

18 Sexual problems are common complaints for both men and women, negatively
19 affecting individuals' quality of life and well-being. The current study showed that
20 sexual body fluids successfully induced disgust and resulted in a stronger disgust
21 reaction toward the subsequent erotic stimuli. Sexual body fluids reduced sexual
22 arousal toward subsequent erotic stimuli presented to women who consumed placebo
23 but increased the likelihood of sexual engagement in women who consumed ginger.
24 Administering ginger enhanced sexual arousal toward the erotic stimuli in both men
25 and women. Ginger may be a potential treatment for sexual problems, while long-

1 term interventions are needed to test the effects of ginger on sexual function in people
2 with and without sexual difficulties.

3 **Conflict of Interest:** The authors report no conflicts of interest in this study.

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6 **Data availability statement.** The authors confirm that the data supporting the
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8

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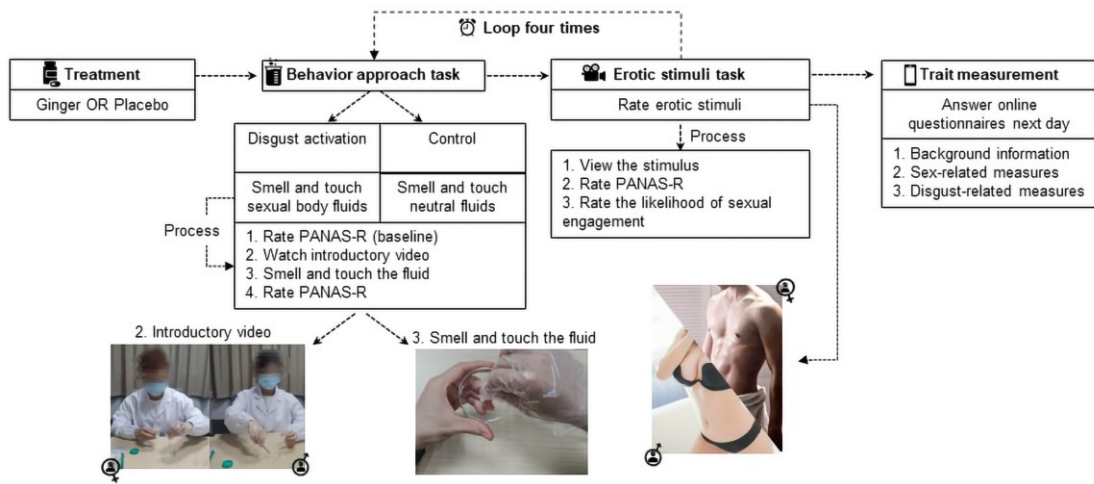
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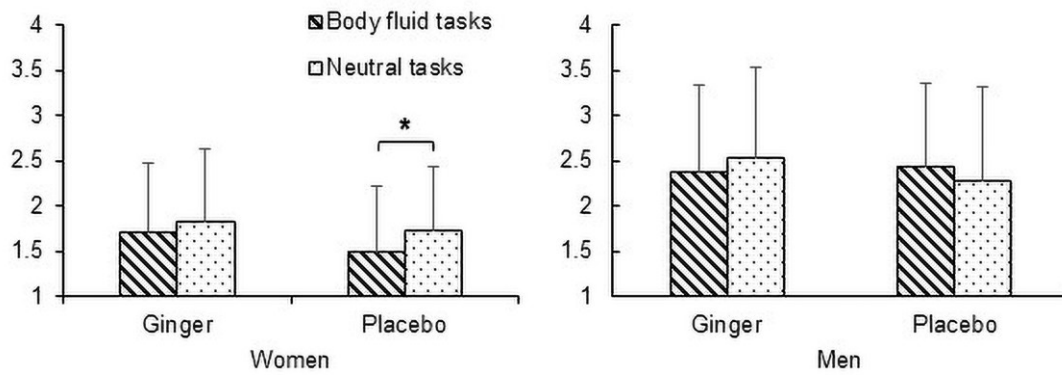


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2 **Figure 1.** Flowchart of the study procedures

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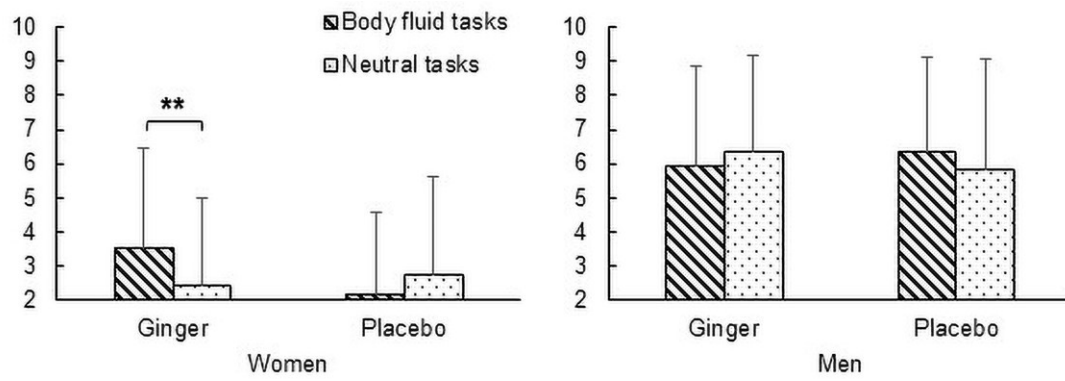
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2 **Figure 2.** The effects of task type on feelings of sexual arousal toward the erotic stimuli and
 3 the moderating effects of sex and ginger.

4 * $p < .05$

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2 **Figure 3.** The effects of task type on the likelihood of sexual engagement toward the erotic
 3 stimuli and the moderating effects of sex and ginger.

4 ****** $p < .01$.

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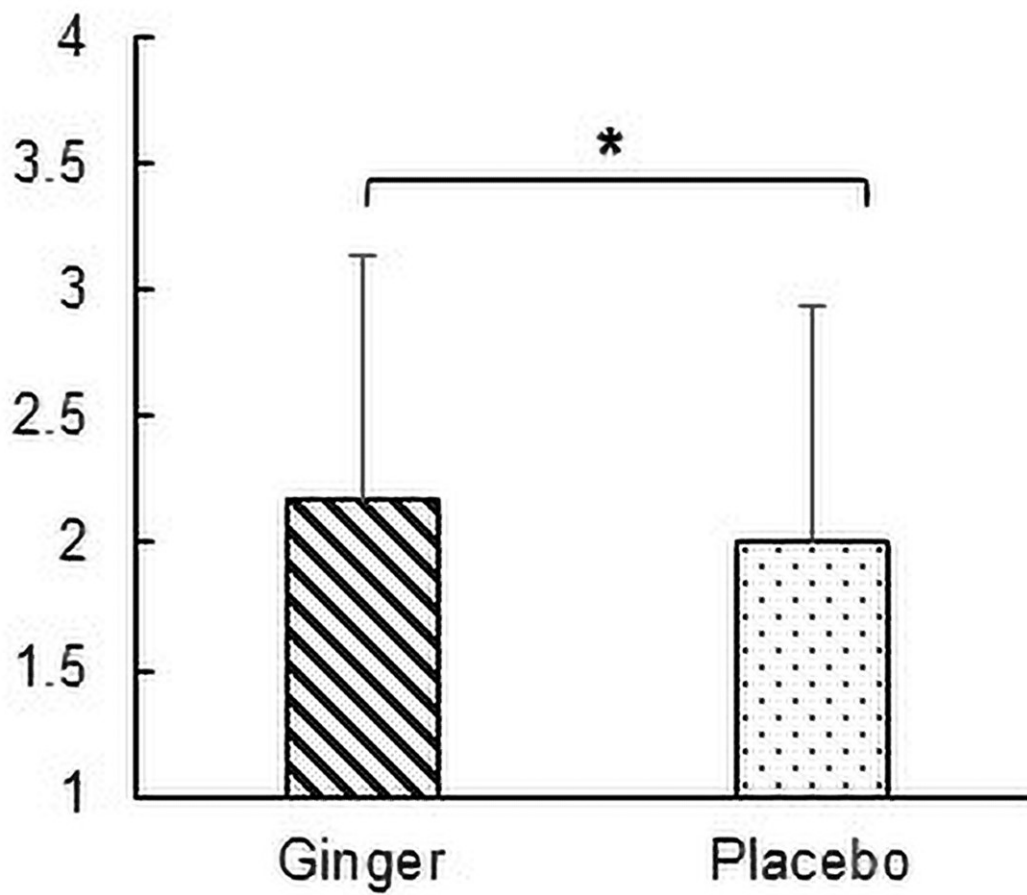
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Figure 4. The effects of ginger on feelings of sexual arousal toward the erotic stimuli in participants who completed the neutral fluids tasks.

* $p < .05$.

Table 1.Demographic Variables of the Sample ($N = 247$)

		Women				Men			
		Neutral fluids		Sexual body fluids		Neutral fluids		Sexual body fluids	
		Ginger	Placebo	Ginger	Placebo	Ginger	Placebo	Ginger	Placebo
Age		20.87(1.80)	22.07(2.27)	21.28(1.73)	20.68(2.02)	21.76(3.23)	21.63(3.04)	21.94(2.56)	22.48(2.90)
Lifetime number of sexual partners		0.55(0.81)	0.78(2.01)	1.56(3.44)	0.48(0.85)	0.86(0.92)	1.15(1.56)	1.00(1.25)	1.64(2.63)
Sex	Women	31	28	32	31	-	-	-	-
	Men	-	-	-	-	29	30	33	33
Education	≤ Senior high school	0	0	1	2	0	0	0	0
	> Senior high school	31	27	31	29	29	27	33	33
Occupation	Student	30	24	32	30	25	27	33	31
	Employed worker	1	3	0	1	3	0	0	2
	Other	0	0	0	0	1	0	0	0
	Single	22	16	26	18	16	13	16	20
Relationship length	Less than 1 month	1	0	0	1	2	1	1	0
	1-3 months	1	1	2	0	3	1	4	2
	4-6 months	0	0	0	1	2	3	6	2
	7-12 months	1	4	2	1	1	2	4	4
	1-2 years	3	5	1	6	4	3	2	2
	3-5 years	3	0	1	4	1	2	0	2
	6-10 years	0	1	0	0	0	2	0	1
Income (¥)	No	18	9	15	13	18	16	16	16
	Less than 5k	12	14	16	16	6	9	14	15
	5k-8k	1	3	1	1	3	2	2	1
	9k-15k	0	1	0	1	2	0	1	1
Health condition	Excellent	8	6	6	8	8	9	10	12
	Very good	11	9	16	13	14	10	9	12
	Good	8	6	7	5	6	7	11	6

Fair	4	6	3	4	1	1	3	3
Poor	0	0	0	1	0	0	0	0

Table 2.

Means for Participants' Feelings and Reactions toward the Fluids Tasks and the Erotic Stimuli Grouped by Sex, Task Type, and Ginger

Outcomes	Women								Men							
	Neutral fluids				Sexual body fluids				Neutral fluids				Sexual body fluids			
	Ginger		Placebo		Ginger		Placebo		Ginger		Placebo		Ginger		Placebo	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Disgust toward the fluids tasks	1.06	0.25	1.13	0.44	2.72	1.16	2.67	1.32	1.18	0.50	1.10	0.35	2.22	1.16	2.30	1.23
Sexual arousal toward the fluids tasks	1.07	0.29	1.03	0.16	1.05	0.26	1.07	0.29	1.08	0.27	1.08	0.33	1.45	0.78	1.24	0.57
Sexual arousal toward the erotic stimuli	1.82	0.82	1.73	0.70	1.71	0.78	1.49	0.73	2.53	1.00	2.28	1.04	2.38	0.96	2.43	0.93
Likelihood of sexual engagement	2.44	2.55	2.76	2.86	3.53	2.91	2.18	2.42	6.36	2.83	5.85	3.24	5.93	2.94	6.37	2.77
Disgust toward the erotic stimuli	1.84	0.94	2.04	1.13	2.09	1.04	2.35	1.18	1.26	0.62	1.24	0.50	1.37	0.71	1.33	0.64

Table 3.

Mixed Linear Models Showing Effects of Task Type and the Moderating Effects of Sex and Ginger on Feelings and Reactions toward the Fluids Tasks and the Erotic Stimuli

Outcomes	Predictors	<i>df</i>	<i>f</i>	<i>p</i>
Disgust toward the tasks	Task type	948.93	505.51	< .001
	Task type*Sex	948.93	15.49	< .001
	Task type*Ginger	948.93	0.02	.893
	Task type*Sex*Ginger	948.93	0.97	.325
Sexual arousal toward the tasks	Task type	749.83	9.28	.002
	Task type*Sex	749.83	12.60	< .001
	Task type*Ginger	749.83	4.43	.036
	Task type*Sex*Ginger	749.83	7.34	.007
Sexual arousal toward the erotic stimuli	Task type	968.09	2.76	.097
	Task type*Sex	968.09	2.16	.142
	Task type*Ginger	968.09	0.69	.405
	Task type*Sex*Ginger	968.09	4.39	.036
Likelihood of sexual engagement toward the erotic stimuli	Task type	979.08	0.70	.404
	Task type*Sex	979.08	0.34	.562
	Task type*Ginger	979.08	0.99	.319
	Task type*Sex*Ginger	979.08	13.38	< .001
Disgust toward the erotic stimuli	Task type	954.69	10.59	.001
	Task type*Sex	954.69	2.70	.101
	Task type*Ginger	954.69	0.12	.731
	Task type*Sex*Ginger	954.69	0.27	.607

Table 4.

Mixed Linear Models Showing Effects of Ginger and the Moderating Effects of Sex on Feelings and Reactions toward the Erotic Stimuli

Outcomes	Predictors	<i>df</i>	<i>f</i>	<i>p</i>
Sexual arousal toward the erotic stimuli	Ginger	461.38	4.23	.040
	Ginger*Sex	461.38	1.11	.293
Likelihood of sexual engagement toward the erotic stimuli	Ginger	465.09	0.13	.719
	Ginger*Sex	465.09	2.40	.122
Disgust toward the erotic stimuli	Ginger	462.16	1.45	.230
	Ginger*Sex	462.16	2.13	.145

Note: The analysis restricted data only to participants who completed the neutral fluids tasks.