

MEASURES OF IMPLICIT AND EXPLICIT ATTITUDES TOWARD MAINSTREAM AND BDSM SEXUAL TERMS USING THE IRAP AND QUESTIONNAIRE WITH BDSM/FETISH AND STUDENT PARTICIPANTS

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The Implicit Relational Assessment Procedure (IRAP) examines implicit attitudes through the measurement of response latencies. In this study, the IRAP was used to assess implicit attitudes toward "mainstream" sexual terms (e.g., Kissing) and "BDSM" terms (e.g., Bondage) among individuals reporting BDSM interests and among students who did not report such interests. A questionnaire was used to measure explicit attitudes toward the same sexual terms as well as self-reported sexual behaviors. Results showed that the Student group generally displayed pro-mainstream attitudes, while the BDSM group displayed pro-BDSM attitudes. These effects were mirrored in the questionnaire results, which provides support for the IRAP as a potentially useful tool in measuring participant attitudes toward complex sexual stimuli.

Key words: Implicit Relational Assessment Procedure, sexual behavior, BDSM, relational frame theory

Greenwald and Banaji (1995) defined implicit attitudes as being the result of past experiences and stated that they mediate feelings, thoughts, or behaviors toward certain social objects. The authors indicated that individuals are not always conscious of social attitudes. Although questionnaires can evoke attitudinal responses from participants, they are limited, in that self-presentational strategies and deception can skew the validity of responses (De Houwer, 2002; De Jong, 2002). Explicit attitudes gathered from questionnaires may not always correspond to implicit attitudes of the individual, and researchers, including Greenwald and Banaji, have turned to other methods of attitude assessment that are less vulnerable to these types of confounds.

The Implicit Association Test (IAT)

The Implicit Association Test (IAT) is an assessment tool used to measure attitudes that might not necessarily be detected from questionnaire responses. These "hidden" attitudes are measured by an individual

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participant's latency to respond when asked to pair specific stimuli on a computer screen (De Houwer, 2002). Greenwald's seminal IAT study included a timed computer task in which participants were required to pair certain textual stimuli (*Flower, Insect*, etc.) with other contextual stimuli (*Pleasant, Unpleasant*; Greenwald, McGhee, & Schwartz, 1998). Response latencies on the tasks of pairing the words *flower* and *pleasant* and the words *insect* and *unpleasant* were compared to an opposite task of pairing *insect* with *pleasant* and *flower* with *unpleasant*. Greenwald and colleagues hypothesized that the first type of responses would have a shorter response latency than the second type of responses, as those associations (beliefs or attitudes) were already present in most individuals' verbal repertoires. Results of this study indicated that participants did indeed respond more quickly to trials in which words like *flower* were paired with positive terms, and took a longer amount of time to pair words like *insect* with a positive term (Greenwald et al., 1998). This type of response outcome, in which responses are consistently shorter for the first type of trial and longer for the second type, is called *the IAT effect*.

Multiple researchers have replicated this basic IAT effect using a variety of stimuli (De Jong, 2002; Gemar, Segal, Segratti, & Kennedy, 2001; Teachman, Gregg, & Woody, 2001), and it has been used in multiple contexts to examine negative stereotypes of individuals of different races and sexual orientations (Greenwald et al., 1998; Swanson, Rudman, & Greenwald, 2001). However, several researchers have identified limitations accompanying the use of the IAT. Although the IAT assesses basic existing associations of stimuli, De Houwer (2002) indicated that it cannot be used to assess complex verbal relational networks, or the directional relationship between stimuli. The Implicit Relational Assessment Procedure (IRAP) is a more specialized tool, in that specific relational terms are employed to examine current relations among the stimuli (Barnes-Holmes et al., 2006).

The Implicit Relational Assessment Procedure (IRAP) as an Extension of the IAT

One of the most prominent and well-established procedures to date that assess the specific nature of relationships between stimuli is the IRAP (Greenwald et al., 1998). This latency-based computer task is based on the principles of Relational Frame Theory, a modern behavior-analytic approach to language and cognition (Hayes, Barnes-Holmes, & Roche, 2001). According to Relational Frame Theory, specific stimulus relations, such as *bigger, smaller, better, worse*, and so forth, rather than simple response pairings, are the critical indicators of how human cognition operates (Barnes-Holmes et al., 2006). The IRAP task measures specific verbal relations that have been established and strengthened through an individual's learning history.

Barnes-Holmes and others have conducted studies with the IRAP to determine its reliability as a measure of implicit attitudes (McKenna, Barnes-Holmes, Barnes-Holmes, & Stewart, 2007) and have used the IRAP to measure Irish participants' attitudes about the likeability of individuals from different social groups (Barnes-Holmes et al., 2006). The IRAP has also been utilized in the measurement of autism therapists' attitudes toward children with autism and typically developing children (Milne, Barnes-Holmes,

Barnes-Holmes, & Stewart, 2005) and student and nonstudent participants' attitudes regarding homosexual individuals (Cullen, Barnes-Holmes, Barnes-Holmes, & Stewart, 2007).

Thus, the IRAP is a measure of an individual's implicit attitudes or beliefs that may not directly correspond to explicit attitudes measured by questionnaire responses. Furthermore, the IRAP has certain advantages over the IAT, in that it requires an individual to respond to stimuli according to specific relations so that the strength of those relations can be assessed. In addition, because the IRAP task is more complex than the IAT, its effects are more difficult (and perhaps impossible) to fake (McKenna et al., 2007).

BDSM and Fetish Behavior

The current study incorporated the IRAP computer task and a questionnaire task to examine participant attitudes toward sexual terms that are associated with BDSM/fetish practices and toward terms that are more "mainstream" or typical of non-BDSM/fetish practices.

BDSM (or Bondage, Discipline/Domination, Sadism, and Masochism) is an acronym indicative of a group of behaviors and lifestyle practices that include a variety of fetishes, role-playing, and other nonmainstream activities. About 10% of the U.S. population reports that they engage in BDSM practices on at least an occasional basis (Masters, Johnson, & Kolodny, 1995). In a study by Moser and Levitt (1987), the most commonly reported activities included flagellation and bondage. Weinberg, Williams, and Moser (1984) found five features that exist in most BDSM interactions. First, one partner typically takes on a more dominant role, while the other partner acts in a submissive role. Second, partners freely consent to adhere to preestablished limits or guidelines. Third, both parties understand that the activities are sexual in nature for at least one participant. Fourth, there is a shared understanding that activities are of a BDSM nature. Fifth, interactions may involve role-play, in which one or both partners assume roles that are not based in reality, for an agreed-upon amount of time.

A *fetish* is defined as an object, body part, or behavior that triggers sexual responsiveness in an individual. The focus of the fetish is not innately sexual and can include feet or shoes, leather, latex, the act of smoking, or a variety of other stimuli (Wiseman, 1996). *Sexual sadism* is defined as the enjoyment of administering pain or humiliation to another individual, and *sexual masochism* is the enjoyment of receiving pain or humiliation (Wiseman, 1996). In defining fetishism, sadism, and masochism, Wiseman excluded the *DSM-IV* criteria of emotional distress and environmental impairment. Moreover, he specified that for these practices to be considered part of a BDSM lifestyle, they must be carried out in a safe and consensual manner. This is distinct from the *DSM-IV* criterion of sexual sadism, which requires the involvement of a nonconsenting individual.

Because attitudes regarding mainstream and BDSM sexual practices may be sensitive to the confounds of traditional measurement by questionnaire, these attitudes may be more effectively detected with the IRAP program. By assessing participant implicit sexual attitudes via the IRAP, it is possible to determine the extent to which IRAP responding correlates with explicit responding on a questionnaire, as well as with participant self-reported participation in certain sexual practices.

The Present Study

In the current study, the IRAP task was used to measure implicit attitudes regarding four “mainstream” and four “BDSM” sexual terms, and a self-report visual analogue scale (VAS) was used to measure participants’ explicit attitudes about those same eight terms. If the IRAP task does, in fact, measure implicit attitudes related to sexual terms, then individuals who rate mainstream sexual terms as healthier than BDSM terms on the questionnaire are also likely to display shorter IRAP response latencies during pro-mainstream than during pro-BDSM test blocks.

This study addressed the relationship between relational responding on the IRAP, self-reported attitudes, and self-reported sexual experiences, BDSM and otherwise. Responses were gathered from two groups of participants: those who were involved in BDSM or fetish activities, and graduate psychology students who did not identify as participating in BDSM or fetish activities. This research examined whether participants’ response latencies to mainstream and BDSM sexual terms varied significantly between these two groups of participants. In addition, IRAP response latencies were compared to self-reports on the sexual experience and VAS portion of the questionnaire, to examine whether response latencies on the IRAP task consistently related to self-reported frequencies of sexual behaviors and to explicit attitudes toward sexual terms.

Method

Participants

Individuals With BDSM/Fetish Interests. Participants for the BDSM/Fetish group were recruited through an online job-posting service. Individuals who responded to the posting were sent an informational email describing the requirements of study participation in more detail. This email contained specific questions for the potential participant to answer, pertaining to age, gender, highest level of completed education, information on vision capabilities, whether they considered themselves to have a fetish and why or why not, and whether they considered themselves to live a lifestyle related to BDSM and why or why not.

Participants were assigned to the BDSM/Fetish group if they self-identified as “kinky” or “into BDSM” and reported enjoyment in at least one BDSM or fetish-related activity (flogging, sadism, masochism, bondage, etc.) on the reply email and subsequently on the sexual experience questionnaire. All individuals selected from the online responses qualified for the BDSM/Fetish group. Three men and one woman in this group did not meet criteria on the IRAP, and their data were excluded from the study.

Nine individuals who successfully completed the sexual experience questionnaire and the IRAP task formed the BDSM/Fetish group. This group (age range 21–34 years, mean = 27) comprised four men, four women, and one female-to-male transgendered individual. All participants reported that they had a minimum education level of a high school diploma, were fluent in English, and had vision that was either normal or corrected to normal with glasses or contacts.

Graduate Students. Individuals were assigned to the Student group if, on the questionnaire, they did not self-identify as being a participant of a BDSM/fetish lifestyle and did not report participation in a significant level of BDSM or fetish behaviors. One female student did not pass the IRAP task, and her data were excluded from this study.

Eight graduate psychology students successfully completed all tasks and made up the Student, or Non-BDSM/Fetish, group. This group (age range 23–27 years, mean = 24) comprised four men and four women. All participants were enrolled in either a master’s-level or doctoral-level psychology program, were fluent in English, and had vision that was either normal or corrected to normal with glasses or contacts. Additionally, they all reported completion of at least one graduate-level psychopathology class. This requirement was to increase the likelihood that they would be at least somewhat familiar with the sexual terms used in the questionnaire and in the IRAP task.

Setting, Apparatus, and Materials

All sessions were held in a small meeting room, with the exception of one: One male student participant completed the study alone in a larger classroom on the same floor. Each participant attended one session, which was between 30 and 60 minutes in length. After the completion of the session, no further contact was requested from any participant.

Materials used included an informed consent form and a paper questionnaire that (a) probed for participants’ types of sexual experiences and (b) attempted to measure their explicit attitudes toward eight sexual terms (also used in the IRAP task; see Table 1). Procedures also involved the IRAP task, which was completed on an HP Compaq NC4000 laptop computer. The IRAP task was created and accessed through the <https://rft.ori.org> website.

Table 1
Textual Stimuli Employed in the IRAP Computer Task

Sample 1: HEALTHY	Sample 2: SICK
Response Option 1: TRUE (Similar)	Response Option 2: FALSE (Opposite)
Targets consistent with Sample 1:	Targets consistent with Sample 2:
Caress	Fetish
Kissing	Sadism
Missionary Position	Masochism
Make Love	Bondage

Selection of the eight sexual terms used in the IRAP task and VAS portion of the questionnaire was based on research of common BDSM/fetish practices and terminology, and on brainstorming sessions with colleagues and supervisors. The two lists of sexual terms (provided in Table 1) were chosen based on their representation of mainstream and BDSM/fetish sexual behavior, and on their relative readability.

Procedure

Informed Consent/Confidentiality. At the beginning of the session, the participant read an informed consent form which stated that participation was confidential and that it involved viewing and responding to sex-related

words. The participant was given the option to state his or her verbal consent to participate (in this case, no record of the participant's name was kept), to sign his or her name on the consent form (written consent), or to decline participation at any time. Following the participant's session, all potentially identifying information, including emails and email addresses, was deleted. In addition, the experimenter informed each participant that community mental health services were available in the case of emotional discomfort resulting from exposure to stimuli used in the study. No participants requested these resources or declined participation at any time during the session.

Questionnaire. The questionnaire, adapted from <http://bdsm.sexresearch.org>, served as a tool for gathering information on the diversity of sexual practices reported by participants. One portion of the questionnaire contained a list of 40 distinct sexual behaviors or practices, and in the case of each of the activities, participants were asked to check off if they had experience doing, watching, or fantasizing about that activity (see Appendix A). The list of activities was diverse and ranged from more mainstream activities (oral sex, penetration) to more BDSM-specific activities (fetish play, spanking, piercing play, etc.). The number of responses that a participant checked for each of the three categories was tallied to yield three overall sexual experience scores (doing, watching, and fantasizing) that could each range from 0 to 40.

The final page of the questionnaire asked participants to rate their attitudes toward a series of sexual terms on a VAS with a 100-mm line directly above each term, the word *sick* to the left of the line toward 0 mm, and the word *healthy* to the right of the line toward 100 mm. These terms were also the target stimuli employed in the IRAP task: *caress*, *kissing*, *missionary position*, and *make love* (i.e., "mainstream" sexual terms), and *fetish*, *sadism*, *masochism*, and *bondage* (i.e., "BDSM" sexual terms). For each term, the participant was asked to make a vertical mark on the line to indicate his or her attitude about the term. This portion of the questionnaire examined each participant's explicit attitudes toward each term. Both the primary experimenter and a second observer measured and recorded the VAS values. Responses fell between 0 mm and 100 mm. Any discrepancies were rechecked by the primary experimenter; 1 disagreement out of 136 occurred, in which there was a discrepancy of 1 mm. The primary experimenter's measurement was retained.

IRAP Task. To begin the IRAP task, the participant read directions displayed on a computer screen and advanced them by pressing the spacebar. Directions indicated that the task would sometimes require participants to respond in a way that agreed with what they believed, and other times in a way that disagreed with what they believed. Sample trials were shown on the screen, indicating how to make a "True" or "False" response, and indicating that if a red X flashed on the screen, the participant should quickly make the alternate response.

Next, participants completed the practice blocks. Once criteria were reached during two consecutive practice blocks (80% or better correct responding at a maximum average latency of 3,000 ms), participants began the first of six test blocks. Upon completion of one test block, participants were required to press the spacebar to begin the next block. The IRAP

computer program controlled all groups of visual stimuli that were presented on the screen and also recorded the response latencies for each trial.

After completing each individual practice block and test block, participants viewed summative feedback on their performance and read an instruction indicating that previously correct and incorrect answers would be reversed during the next test block. Once the spacebar was pressed, the reversed block began. For participants who completed six practice blocks but were unable to meet the criteria of 80% correct and a maximum average latency of 3,000 ms on two consecutive practice blocks, a thank-you message was displayed on the computer screen, indicating that participation was complete.

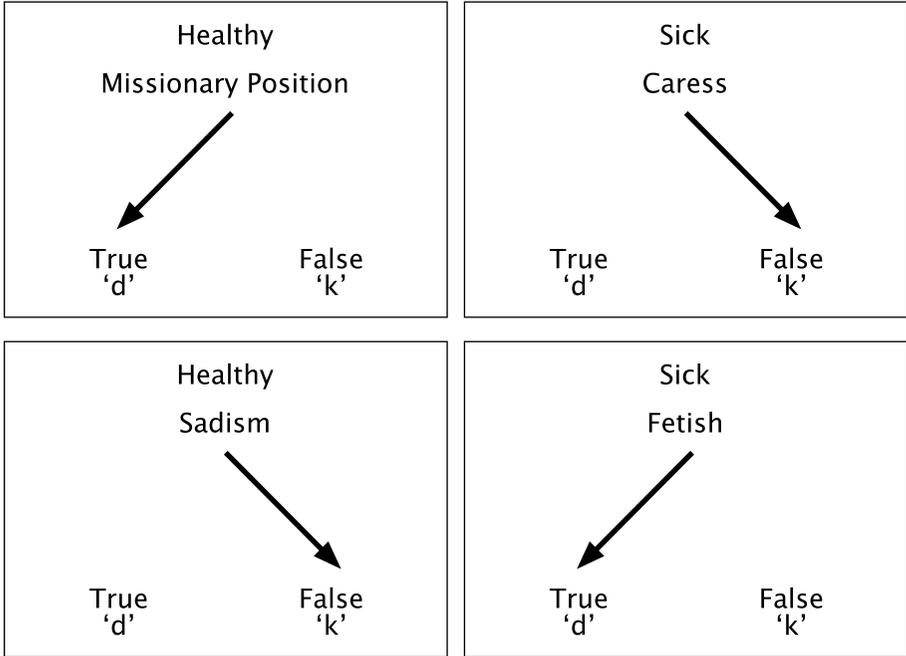
Each of the practice blocks and test blocks was composed of trials in which the top of the screen showed one of two stimuli: "Healthy" or "Sick." In the center of the screen, one of the target terms from either the mainstream or BDSM term list was displayed. At the very bottom of the screen, the two response options, "True" and "False," were displayed. During each testing block, all of the terms from each list were rotated randomly (without replacement), and each term from the two lists was presented once with "Healthy" and once with "Sick." Stimuli remained on the screen until the participant pressed a key corresponding with either the "True" or "False" response—the letter *D* or the letter *K*—depending on the left-right placement of these two stimuli during the trial. If the participant chose the correct term for that trial, all stimuli disappeared from the screen for 400 ms and a new set of stimuli was presented. If a participant selected the term deemed incorrect during that text block, the screen flashed a red *X* and the participant was required to make the correct response before the stimuli were cleared from the screen and the next trial was presented.

Whether a response was correct or incorrect was dependent on whether the test block was pro-mainstream or pro-BDSM. During pro-mainstream trials, terms from the mainstream list were paired with "Healthy" and terms from the BDSM list were paired with "Sick." During pro-BDSM trials, BDSM terms were paired with "Healthy" and mainstream terms were paired with "Sick." Each entire block was either pro-mainstream or pro-BDSM, and this did not change until the participant pressed the spacebar to begin the next test block. At the end of each test block, the participant was cued that previously correct and incorrect responses would be reversed in the next block. Figure 1 includes several examples of which sets of stimuli appeared during each testing block.

Participants were assigned to begin the IRAP task with either a pro-mainstream-first or a pro-BDSM-first test block, and this assignment was counterbalanced within groups. Each participant completed three pro-mainstream trial blocks and three pro-BDSM trial blocks in alternating order after meeting criteria in the practice blocks.

Debriefing. At the end of the session, the experimenter explained the basic purpose of the study and answered any questions that the participant asked about the procedures or the purpose of the study. Finally, participants were given a \$15 prepaid Visa card at the end of the session, regardless of whether or not they met criterion on the IRAP task.

Sample Consistent Trials



Sample Inconsistent Trials

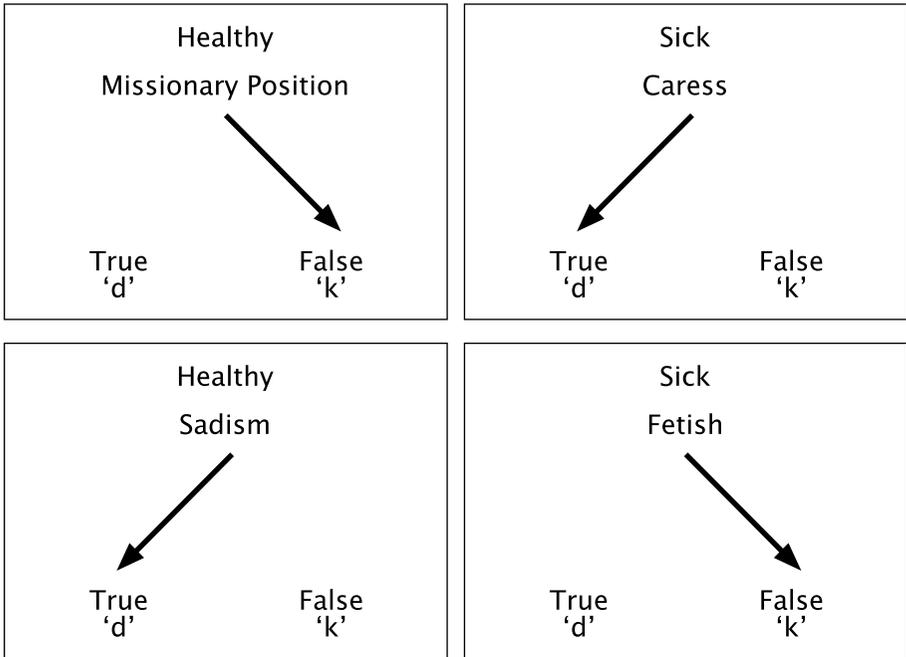


Figure 1. Sample screen shots from consistent and inconsistent IRAP task trials. Arrows indicate the correct response during consistent and inconsistent trials; they did not appear on the screen.

Results

IRAP

The IRAP program measured each participant's individual response latencies in milliseconds from the onset of the trial to the participant's correct response. All participants achieved 80% correct or better during the IRAP practice blocks, which indicates that the stimuli involved in the task were likely to demonstrate reliable relational control, and these levels of accuracy minimized the potential variability caused by high levels of incorrect responding (Vahey, Barnes-Holmes, Barnes-Holmes, & Stewart, 2009).

D-IRAP-Algorithm. Because a large number of participant test block responses exceeded 3,000 ms, the current study utilized an adaptation of the D-IRAP-algorithm, a method of analysis derived from Greenwald, Nosek, and Banaji's (2003) IAT D-algorithm. Vahey and colleagues (2009) also employed the D-IRAP-algorithm in the analysis of self-esteem levels of students and prisoners, and provide an excellent synopsis of the algorithm. IRAP response latencies tended to be longer in the BDSM/Fetish group than in the Student group. In this type of situation, participants with longer latencies can show larger response effects than individuals who respond faster if the raw latency scores are employed in analysis (Greenwald et al., 2003). Because the D-IRAP-algorithm incorporates the standard deviations of participants' responses to calculate individual scores, the amplified effect size related to high latencies is minimized (Vahey et al., 2009).

Combined D-IRAP scores for each participant represent the difference in latency between responding in pro-BDSM and pro-mainstream trials. If there is no difference between the two types of test blocks, the combined D-IRAP score will fall at 0. Longer pro-BDSM trial latencies will produce an overall positive D-IRAP score, and longer pro-mainstream trial latencies will produce an overall negative D-IRAP score.

Preliminary Analysis for Order and Test Sequence. In this study, each participant completed a total of three alternations of pro-mainstream and pro-BDSM test blocks (test sequence) and began with either a pro-mainstream test block or a pro-BDSM test block (order). To determine whether the test sequence or test block order interacted with the D-IRAP score effect, participant scores were entered into a 2×3 mixed repeated-measures ANOVA with test sequence as the within-participant variable and order as the between-participants variable. Neither main effects nor interaction were significant, $F(1, 15) = .064$; $p > .8$, and thus neither test sequence nor order was included in the remainder of the analyses.

Participant-Type Analyses. Average D-IRAP scores were calculated for the BDSM/Fetish group and the Student group and are displayed in Figure 2. The data demonstrate that, as a group, student participants displayed a positive D-IRAP score (mean D-IRAP = .240421; range = -.14774 to .68982), whereas the BDSM/Fetish group demonstrated a negative D-IRAP score (mean D-IRAP = -.07175; range = -.032687 to .19834). In general, the Student group produced a shorter mean latency during pro-mainstream blocks (involving trials requiring them to pair mainstream sexual terms with "Healthy" and BDSM terms with "Sick") than during pro-BDSM blocks (involving trials requiring them to pair mainstream terms with "Sick" and BDSM terms with

“Healthy”). The BDSM/Fetish group displayed the opposite effect, with a shorter mean latency for pro-BDSM than for pro-mainstream trial blocks. The ranges indicate, however, that there were individual exceptions to these general effects. D-IRAP scores were entered into a two-way repeated measures ANOVA with group and term type as the factors; this produced a significant effect for group, $F(1, 15) = 7.430$, $p = .016$, partial eta squared = .331.

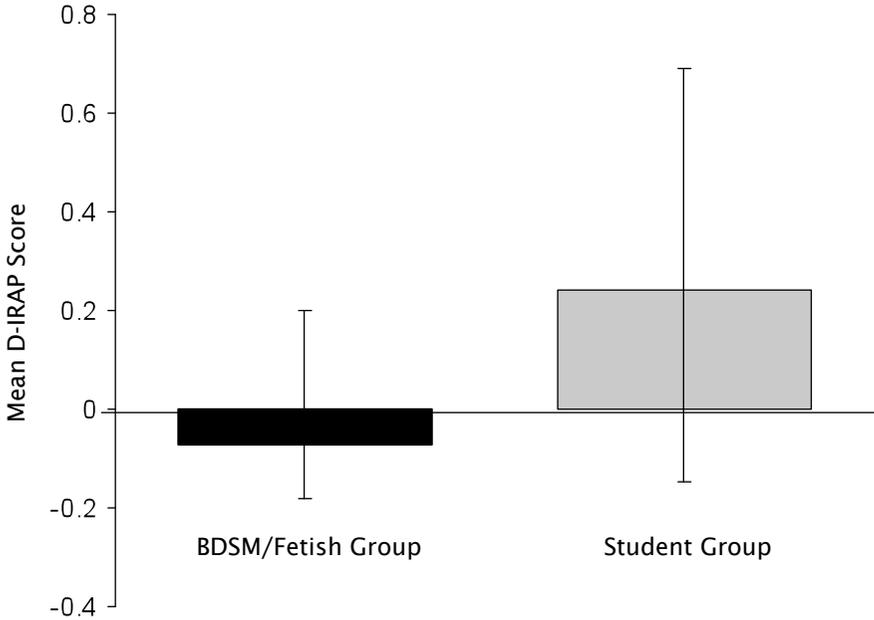


Figure 2. Average D-IRAP scores for BDSM/Fetish and Student groups. Error bars represent the range of responding in each group.

Group responses were also examined according to target type (i.e., whether the term was mainstream or BDSM). D-IRAP scores for these two types of trials were examined for each group and are displayed in Figure 3. The average BDSM/Fetish group D-IRAP score for mainstream terms (upper panel left side) was positive but small (mean = .03421, range = -.29797 to .14953), indicating that responses tended to be slightly quicker when pairing mainstream terms with “Healthy” than with “Sick.” The BDSM/Fetish group average D-IRAP score for BDSM terms was negative (mean = -.19018, range = -.71027 to .14953), indicating quicker responding when pairing BDSM terms with “Healthy” than with “Sick.” In contrast, the average Student group D-IRAP scores (bottom panel right side) for both mainstream terms (mean = .11375, range = -.01055 to .94464) and BDSM terms (mean = .36709, range = -.17897 to .45265) were positive, indicating that responses tended to be quicker when pairing mainstream terms with “Healthy” rather than with “Sick,” and when pairing BDSM terms with “Sick” rather than with “Healthy.” The two-way repeated measures ANOVA mentioned in the previous paragraph produced a significant effect for term type, in that the D-IRAP scores for mainstream terms were significantly higher than the scores for BDSM terms, $F(1, 15) = 6.549$, $p = .011$, partial eta squared = .03, but the interaction was not significant, $F(1, 15) = .476$, $p > .4$.

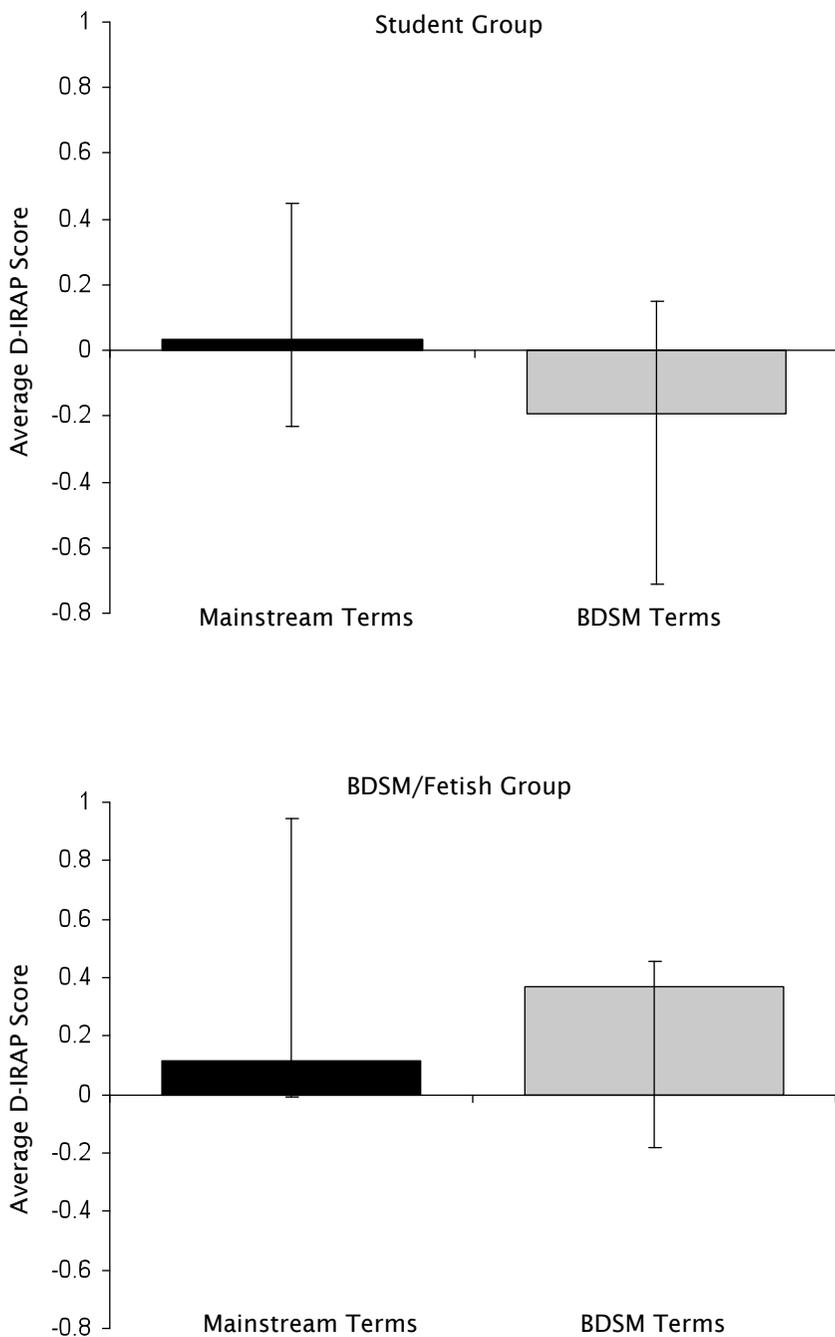


Figure 3. Average D-IRAP scores for mainstream and BDSM terms for the Student group (top panel) and the BDSM/Fetish group (bottom panel). Error bars represent the range of responding in each group.

Questionnaire

Identification With Alternative Sexual Lifestyle. The questionnaire required participants to answer the question “Do you consider yourself to be into BDSM?” All participants assigned to the BDSM/Fetish group marked the response “yes,” and all of the participants from the Student group marked “no.” For the question “Do you have a fetish?,” 7 of the 9 BDSM/Fetish group participants (78%) marked “yes” and all of the Student group participants marked “no.”

Visual Analogue Scale (VAS) of Sexual Terms. The VAS portion of the questionnaire required participants to rate each of the eight sexual terms by making a mark on a horizontal scale ranging from 0 to 100 mm, with 0 mm representing “Sick” and 100 mm representing “Healthy.” Average ratings of each of the terms are displayed in Figure 4. The BDSM/Fetish group ratings for all eight terms were less differentiated across the two groups of terms than the Student group ratings, which showed a lower rating for all four of the BDSM terms than for any of the mainstream terms.

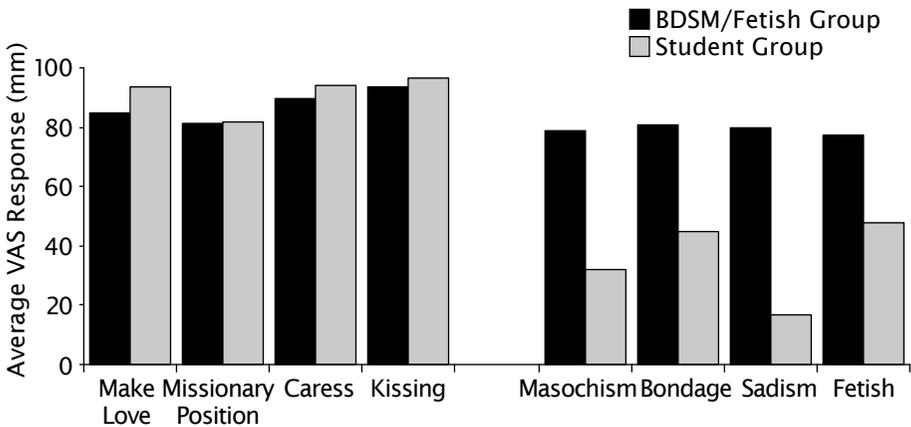


Figure 4. Average ratings (in millimeters) of specific sexual terms on the visual analog scale for the BDSM/Fetish group and Student group. Note that 0 mm corresponded with “sick” and 100 mm corresponded with “healthy.”

A visual analogue scale difference score was calculated for each individual by subtracting his or her average rating of BDSM terms from his or her average rating of the mainstream terms. Difference scores for each participant were entered into a one-way ANOVA with Group as the factor, and this yielded a statistically significant effect for Group, $F(1, 15) = 22.233$, $p = .0003$, partial eta squared = .597. The mean difference score for the BDSM/Fetish group was 9 mm, and the mean difference score for the Student group was 56 mm.

Correlational Analyses of the IRAP Measure and the VAS Measure. A Pearson’s product-moment correlation (r^2) was calculated to assess the relationship between the visual analogue scale rating of sexual terms and the D-IRAP measure of those same terms. The correlation was positive and statistically significant [$r^2 = .282$; $n = 17$; Fisher’s $p = .028$].

Nature and Diversity of Sexual Behaviors Reported. Figure 5 shows the average number of sexual activities that each group reported doing,

watching, and fantasizing about on the questionnaire. As a whole, the BDSM/Fetish group reported experience in doing, watching, and fantasizing about more sexual activities than the Student group. Although there was a great deal of variability in responding for both groups, both the group average and the upper end of the range were consistently higher for the BDSM/Fetish group than for the Student group for doing, watching, and fantasizing. Participant responses for each of the three categories were totaled for each individual and were entered into a one-way between-participants ANOVA. This produced a significant effect for group, $F(1, 15) = 13.222$, $p = .002$, partial eta squared = .469.

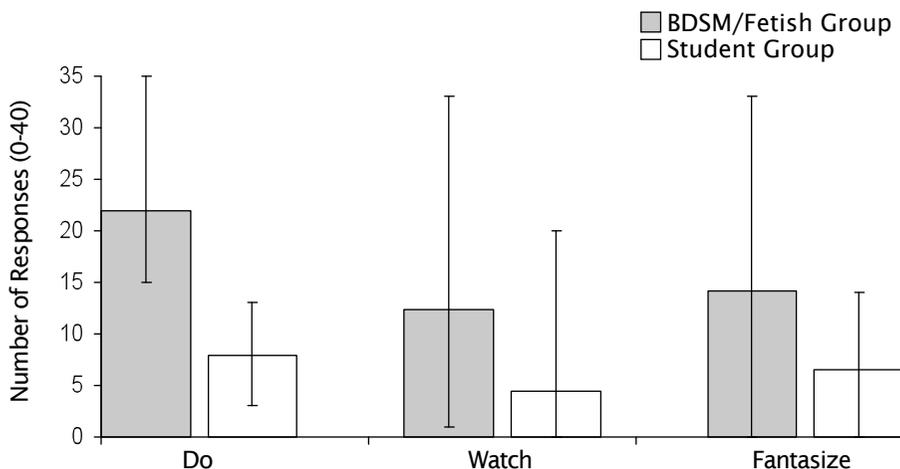


Figure 5. Average number of sexual activities participants reported "doing," "watching," and "fantasizing about" for the BDSM/Fetish group and Student group. Sexual activities include activities considered both mainstream and BDSM-related. Error bars represent the range of individual responding for each category. Totals could range from 0 to 40. See Appendix A for lists of sexual practices.

Correlational Analyses of the IRAP Measure and Self-Reported Diversity of Sexual Behaviors. A combined score of each of the three sexual behavior categories was calculated to produce a single sexual diversity score for each participant. A Pearson's product-moment correlation (r^2) was calculated to assess the relationship between participant sexual diversity scores and D-IRAP scores. The correlation was negative and statistically significant [$r^2 = .271$; $n = 17$; Fisher's $p = .0323$]. In other words, more positive attitudes toward BDSM sexual terms corresponded with higher scores of sexual diversity of behavior and vice versa.

Summary

Preliminary analyses of the D-IRAP scores indicated that the BDSM/Fetish group displayed more positive attitudes toward BDSM terms and that the Student group displayed more positive attitudes toward mainstream sexual terms. This effect was supported by data from the majority of individuals in both groups. Both groups responded more quickly to mainstream sexual terms in the presence of "Healthy" rather than "Sick,"

but a group difference emerged for responses involving BDSM terms: The BDSM/Fetish group responded more quickly to BDSM terms in the presence of "Healthy," whereas the Student group responded more quickly to them in the presence of "Sick." On the VAS portion of the questionnaire, both the BDSM/Fetish group and the Student group rated all four mainstream sexual terms as relatively healthy. BDSM sexual terms were also rated nearly as healthy as the mainstream terms by the BDSM/Fetish group, whereas the Student group rated the BDSM terms as much less healthy than the mainstream terms. IRAP performances correlated positively with the VAS measures across the two groups, and correlated negatively with the diversity of sexual behavior scores. Finally, the BDSM/Fetish group reported experience doing, watching, and fantasizing about more sexual activities than the Student group, a result that is consistent with the group differences seen from the IRAP and questionnaire measures.

Discussion

The current research examined the IRAP's usefulness in detecting sexual attitudes in two groups of participants: individuals who practice a BDSM/fetish lifestyle and graduate students who do not practice a BDSM/fetish lifestyle. This study compared participant responses to mainstream and BDSM sexual terms on the IRAP and on a questionnaire. On the IRAP task, the BDSM/Fetish group produced a negative score, indicating an overall preference for BDSM terms, whereas the Student group produced a positive score, indicating an overall preference for mainstream sexual terms. Members of the Student group demonstrated more positive attitudes toward mainstream sexual terms on the IRAP, and more negative attitudes toward BDSM terms, whereas participants from the BDSM/Fetish group displayed positive attitudes toward both types of terms. This group difference in IRAP responding was supported by the mean visual analogue scale ratings of sexual terms by these two groups. Additionally, the BDSM/Fetish group reported more experience with a variety of sexual practices than participants in the Student group.

The present results suggest that increased experience in BDSM and other fetish activities increases positive implicit and explicit attitudes toward those practices, although it is equally possible that individuals with already established positive attitudes toward BDSM and fetish practices are more likely than others to enter into situations where those practices occur. Results of this study suggest a relation between implicit and explicit attitudes, as well as self-reported behavior and attitudes, regarding mainstream and BDSM sexual practices. The correlational analysis between the D-IRAP scores and the corresponding visual analogue scale difference scores proved to be positive and statistically significant, and the correlation between D-IRAP scores and diversity of sexual behavior scores proved to be negative and statistically significant. Findings indicate that the IRAP, a putative measure of implicit attitudes, correlates significantly with questionnaire responses, an explicit measure; thus, the IRAP may be a useful measure of attitudes toward complex sexual stimuli.

This study, like the study conducted by Vahey and colleagues (2009), employed the D-IRAP-algorithm. Although a similar type of algorithm has been utilized to reduce latency confounds in various IAT studies (Greenwald

et al., 2003), its use with the IRAP is fairly new. Future research is necessary to determine whether and in what conditions the use of the D-IRAP-algorithm produces valid and reliable results and is more appropriate than the more traditional 300-ms to 3,000-ms adjusted latency cutoffs used in other IRAP experiment protocols (Barnes-Holmes et al., 2006; McKenna et al., 2007).

Considerations of the study include the small sample size and demographic differences between members of the two groups. A significant number of males over the age of 50 expressed interest in participating but were excluded in order to include younger individuals who could be more aptly compared to the Student group, whose ages ranged from 23 to 27 years. Future studies should involve a larger participant age range in order to examine responses across a more representative sample of BDSM and fetish practitioners. However, it is worth noting that the results of the study were strong, despite the small sample size, and that data from many of the individual participants demonstrated the general effect indicated by the group averages.

Although the two experimental groups were closely matched according to age, similarity of other environmental factors might be attempted in future studies. For example, all participants from the Student group were enrolled in a graduate psychology program, whereas those in the BDSM/Fetish group tended to have lower educational qualifications. Future research involving individuals who practice BDSM or fetish behaviors would benefit from the inclusion of a comparison group that is also recruited from the community, rather than a specialized psychology graduate student group. Even so, the questionnaire and IRAP response differences from these two groups provide a significant indication of a relationship between implicit and explicit attitudes toward sexual terms despite demographic differences, and pave the way for future research on the measurement of sexual behavior and attitudes.

In light of the significant correlation between implicit and explicit attitudes toward sexual terms presented in this study, the IRAP seems to be a valuable tool for measuring therapist attitudes when the context in which explicit attitudes are assessed, whether by questionnaire or by verbal interview, may increase the risk of self-presentational strategies employed by the therapists. It may also be useful as a posttest following sexuality education workshops. However, one must not be too quick to assume that detection of negative attitudes necessarily corresponds to socially discriminatory behavior. An additional implication for future research involves a more thorough examination of the relationship between implicit attitudes, explicit attitudes, and the overt social behaviors that are related to those attitudes.

A second clinical implication of the IRAP is its potential use as a clinical assessment tool for individuals practicing a BDSM or fetish lifestyle who are involved in therapeutic treatment and demonstrate self-stigmatizing behavior. If the IRAP measures the relative strength of established verbal relations shaped by contextual and historical environmental variables, then these verbal relations can be continually reshaped through contact with new contingencies or new types of relational responding. If clinical distress stems from self-stigmatizing attitudes related to client sexual practices, the IRAP could be a valid measure of

this, and may also be useful in detecting changes in the strength of the client's relational responding throughout the course of therapy.

Interestingly, 2 of 6 male student participants who completed the study qualified as members of the BDSM/Fetish group (and thus their data were not included in the study), and a number of Student group participants expressed a slight interest or experience in mild forms of BDSM or fetish activities, such as spanking and light bondage. Categorization of individuals as belonging to either the BDSM/Fetish group or the non-BDSM/Fetish group was more difficult than anticipated, and gives rise to the notion that BDSM and fetish behavior, like other types of behavior, can best be measured on a continuum rather than by discrete categorization by group. Future studies should examine the degree of behavioral continuity present in groups of individuals who present socially as members of a BDSM or fetish community and in "mainstream" groups who do not present as having any alternative sexual identity. A great deal of human sexual behavior is, to date, largely understudied by the psychological community. Through the experimental study of nonmainstream sexual practices and the attitudes that accompany them, a more comprehensive science of sexual behavior can be established.

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Appendix A

Do you have experience (mark all that apply)	Doing	Watching	Fantasizing About
50. BDSM in general	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Sadism in particular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. Masochism in particular	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Medical fantasy play	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. Sexual fetishism in general	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Shoe/boot fetishism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Rubber/latex/PVC fetishism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Leather fetishism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. Uniform fetishism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Cross-dressing/transvestitism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Wearing baby clothing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fetishism of body parts			
61. (including size of parts, like penis size or breast size):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Body size fetishism (small or large bodies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vaginal penetration			
63. with penis (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64. with strap-on (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. with hand (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. with sex toys (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
67. with other objects (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
68. Cunnilingus (oral/vaginal play) (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
69. Fellatio (oral/penile play) (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anal penetration			
70. with penis (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
71. with strap-on (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
72. with hand (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
73. with sex toys/objects (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
74. Spanking (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
75. Bondage (<input type="checkbox"/> give <input type="checkbox"/> receive)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
76. Discipline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
77. Dominance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
78. Submission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79. Humiliation/Degradation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80. Piercing/needle play (blood play, scarification, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
81. Electricity play	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82. Urination (urophilia)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83. Defecation (coprophilia)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
84. Display of sexual clothing to others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85. Display of genitals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
86. Display of BDSM play (no sex) to others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
87. Display of sexual activity to others, no BDSM activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
88. Display of visible sexual activity with BDSM to others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
89. Other fetish activity:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>