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Cue Reactivity to Images of Alcohol: Creation of a Standardized Picture Set

Kelsey M. Krueger
Syracuse University

Abstract

To study alcohol approach inclinations in a laboratory setting, researchers commonly use cue reactivity paradigms involving presentation of alcohol cues and measurement of responses. However, available picture sets present potential limitations due to their multidimensional nature. A critical task was to develop a set of standardized images without brand labels, actors, or settings, in order to gain a clearer assessment of college students' reactions to alcohol, and alcohol alone, while minimizing contextual influences. In Study 1, a set of images with satisfactory reliability was created. To replicate and expand upon these findings, Study 2 included a sample of 163 participants (82 women, M age = 18.8, 59.3% Caucasian). Following completion of a questionnaire packet of different measures of approach toward alcohol, participants rated 30 affective images from the International Affective Picture System (IAPS), and 30 images of alcohol (beer, wine, liquor). Results demonstrated that our standardized picture set has acceptable psychometric properties associated with an approach valence. Specifically, valence ratings showed (a) acceptable internal consistency and (b) convergent validity with other measures of behavioral approach toward alcohol (viz., reported frequency of alcohol consumption, average number of drinks consumed per drinking day, number of binge drinking days and total drinks consumed per week). These findings suggest that our alcohol images were associated with producing an approach response and support their continued use in college populations.

CUE REACTIVITY TO IMAGES OF ALCOHOL: CREATION OF A STANDARDIZED PICTURE SET

by

Kelsey M. Krueger

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Cue Reactivity to Images of Alcohol: Creation of a Standardized Picture Set

There is a corpus of research examining the induction of alcohol related responses through visual stimuli or cues (e.g., Carter & Tiffany, 1999; Drobes, Carter, & Goldman, 2009; Ostafin, Palfai, & Wechsler, 2003). This area of research, which has studied a variety of substances, has been referred to as cue reactivity (Niaura et al., 1988). Through the use of cue reactivity methods, researchers are able to investigate motivation related to drinking behavior by assessing approach versus avoidance responses. More specifically, use of visual cues has been utilized with both non-dependent alcohol consuming samples (e.g., Kambouropoulos & Staiger, 2009; Mucha, Geier, & Pauli, 1999; Petit et al., 2012; Pulido et al., 2010) and alcohol dependent, patient samples (e.g., Drummond & Glautier, 1994; Fox et al., 2007; Grusser et al., 2002; Sinha et al., 2009). Studying the mechanisms behind drinking behaviors is pertinent to non-dependent college drinking populations, particularly given that heavy drinking during college has been associated with vitiated health and well-being later in life (see Perkins, 2002 for a review).

As discussed below, a set of psychometrically sound images of alcohol alone, designed to elicit an approach response to alcohol, has not been published. Importantly, despite advances in available picture sets, no such set of visual cues has been normed for college drinkers. The purpose of this study was to develop a set of alcohol images that is psychometrically sound, unconfounded by contextual content, and relevant for use with college student drinkers.

The Use of Images to Study College Student Alcohol Use

Patterns of behavior established during adolescence (ages 10-19) and young adulthood (ages 20-24) play an important role in risk of chronic diseases in adulthood (National Research Council and Institute of Medicine, 2009). Healthy People 2020, a campaign led by the U.S.

Department of Health and Human Services, has targeted this developmental time of transition since it is associated with several preventable public health problems, including sexually transmitted infections, motor vehicle accidents, and substance use and abuse (U.S. Department of Health and Human Services 2010). Moreover, this campaign has separately identified substance abuse as a target, citing its reduction as a major objective to promote a healthier nation and improve quality of life. According to the National Center for Education Statistics, the majority of full-time students enrolled in degree-granting institutions are between the ages of 18 and 24, a trend that is anticipated to persist through 2020 (U.S. Department of Education, 2012). Seeing as college-age students (viz., young adults in a developmental transition) and substance abuse both are targets under federal health improvement aims, further research advancing knowledge of college age drinking is in line with national priorities.

Researchers have long studied approach as a measure of the direction of behavioral choices that contribute to the organization of human behavior (Bradley & Lang, 1994). To further understand drinking behaviors, the appetitive nature of alcohol has been investigated in the context of the approach construct (e.g., Cox & Klinger, 1988; Ostafin et al., 2003; Stritzke, Breiner, Curtin & Lang, 2004; Wardell et al., 2011). From a learning theory perspective, positive reinforcement produces approach behavior oriented to obtaining reward, including alcohol use (c.f., Bandura, 1969; Breese, Sinha, & Heilig, 2011; James, 1890; Maisto, Carey, & Bradizza, 1999; Ooteman, Koeter, Vserheul, Schnippers, & van den Bink, 2006; Skinner, 1953). According to this theory, previous positive experiences associated with pleasurable reward may increase the likelihood that an individual will perform that reward-directed behavior again in the future (Bozarth, 1994). When applied to alcohol, approach behavior is thought to reflect

appetitive motivation (Elliot & Covington, 2001); namely, previous positive experiences with alcohol (reinforcement) may encourage individuals to consume alcohol (approach behavior).

The approach construct also is central to the ambivalence model of reward seeking and craving associated with substance related cues, which states that alcohol-related responses are the product of competing inclinations to approach and avoid alcohol (Breiner, Stritzke, & Lang, 1999, McEvoy, Stritzke, French, Lang & Keterman, 2004). For instance, individuals' aversive expectancies (e.g., alcohol will make me feel sick, drowsy) conflict with approach expectancies (e.g., alcohol will make me feel more at ease and less inhibited), thereby inducing a state of ambivalence that can be resolved by approach expectancies being stronger than avoidance expectancies or vice-versa.

Craving has been seen as an important domain to consider when studying drinking, but it does differ from the approach construct (Kavanagh et al., 2013). Approach/avoidance can represent competing desires to drink that are not necessarily characterized by intense perceptions that alcohol will provide immediate relief or reward expected by an alcohol dependent person. In other words, the ambivalence model captures a range of markers of approach, with craving being a specific type of intense desire to approach alcohol. Although craving has been discussed in the context of an intense approach tendency associated with alcohol dependence, there (a) lacks a consensus regarding the definition, (b) is a plentitude of human and animal research indicating that cravings are associated with neurophysiologic alterations related to chronic alcoholism, and (c) lacks an established concordance of self-report measures of craving with relapse and psychophysiological measures of cue reactivity (Anton, 1999; Breese et al., 2011; Li, 2000; Ooteman et al., 2006). Instead of craving, we chose to focus on examining the approach aspects

of cue-reactivity associated with college drinking given that craving research typically relates to alcohol dependence, and that alcohol dependence is not the focus of our study.

To study approach inclinations in a laboratory setting, researchers commonly use cue reactivity paradigms involving presentation of alcohol cues and measurement of responses. Researchers can collect psychophysiological responses such as heart rate, skin conductance or startle reflex (Bradley, Cuthbert & Lang, 1999; Carter & Tiffany, 1999), as well as a variety self-reported responses such as valence, arousal, dominance, desire/urge to drink (Bradley & Lang, 1994; Carter & Tiffany, 1999). In agreement with the ambivalence model, these measured responses are conceptualized to be the net result of the competing domains of approach and avoidance of alcohol. While cues can be presented in a variety of modes, such as *in vivo* or imaginal, photographic presentations are considered to be advantageous as they are both easy to control and realistic (Stritzke et al., 2004).

A New Set of Standardized Images is Warranted

Despite a trend in alcohol research to use cue reactivity techniques as methods to better understand individuals' reactions to images of alcohol, the way to obtain alcohol images has been inconsistent. Some studies include images that originate from magazines or amateur photographs (Pulido, Brown, Cummins, Paulus, & Tapert, 2010), or use images found online (Petit et al., 2012, Pulido et al., 2010), whereas others do not report where they obtained their alcohol images (Heinz et al., 2003; Mucha, Geier, & Pauli, 1999; Mucha et al., 2000; Stritzke et al., 2004). Standardized images of alcohol do currently exist, but each set has its own limitations.

The International Affective Picture System (IAPS) is a well-cited database of standardized images from which many researchers select pictures to use in research (Lang,

Bradley & Cuthbert, 2005). Although this database does contain images of substances, only two images pertain to alcohol. Therefore, researchers who choose to use these standardized IAPS images of alcohol must supplement them with alcohol images from elsewhere. In an effort to expand available standardized images, Stritzke et al. (2004) developed the Normative Appetitive Picture System (NAPS), a database of images of substances depicted in a variety of settings, designed to evoke an approach response. Images were normed for approach, avoidance and arousal. While the NAPS made significant strides in substance cue-reactivity research, the database only contains 18 images of alcohol and still requires supplementation of other images from elsewhere. In essence, images of alcohol available from a larger normed database holds the promise of improving the methodological consistency of cue reactivity research across studies.

Pulido et al. (2010) developed a database of 28 images of alcohol matched with corresponding non-alcoholic beverages. Researchers used a comprehensive method of image selection that assessed valence, arousal, and various other perceptual features in their standardization procedures. Although Pulido et al.'s picture set provided a greater number of available standardized images of alcohol, several limitations raise some concern. For instance, the alcoholic beverages depicted contain labels displaying brand names. The impact of brands on alcohol use is complex. Media exposure to brands has been shown to predict expectancies, and expectancies predict the likeability and desirability of brands; that is, for a group of adolescent participants, both positive expectancies and the likeability of brands directly predict alcohol use (Austin, Chen & Grube, 2006). While these and other recent findings specifically addressed the role of brands exposure in predicting approach behavior in underage youth (Grenard et al., 2013; Morgenstern et al., 2011), there is evidence that brands are salient to college-age populations as well.

Although cross-sectional in design, Ross et al. (2014) found a positive correlation between exposure to brands of alcohol and consumption of those same brands in a sample of 18-20 year old participants. Additionally, Kreusch et al. (2013) found a significant difference in participant reaction time between alcohol images with and without a brand label, asserting that the experimental decision to include brands could affect cognitive biases toward images of alcohol. A critical task, then, would be to develop a set of standardized images without labels in order to gain a cleaner assessment of college students' reactions to alcohol, and alcohol alone, without the potential affective influence of brands.

The most recent picture set to advance alcohol-cue reactivity research has been the Geneva Appetitive Alcohol Pictures (GAAP). Billieux et al. (2011) developed a normative set of 60 alcohol-related images using a sample of 101 Swiss and French participants. Participants rated images on valence, arousal and dominance. The final picture set was subdivided into the following categories: 1) beverages (e.g., different types of alcoholic drinks) 2) drinking behaviors (e.g., people drinking alcohol), and 3) alcohol-related cues (e.g., a corkscrew). Despite strengths in the protocol used in the development of the GAAP, the picture set does come with limitations. First, there is some ambiguity as to which category the images belong. These researchers indicate that when a person is consuming or preparing an alcoholic beverage, that image should be categorized under "drinking behaviors". For example, the image GAAP28 shows a bartender pouring alcohol into mojito glasses, categorized as "drinking behaviors," however a person pouring wine into a glass in GAAP04 is categorized as "beverages". Furthermore, some images combine categorical components such as "beverages" and "alcohol-related cues" (e.g., a bar is considered an "alcohol-related cue" in GAAP54, but a bar back stocked with bottles is considered "beverages" in GAAP20). No statistics on interrater reliability

were presented to justify these decisions. The researchers asserted that different categories of alcohol-related images are necessary to accommodate different research goals; however, the use of ambiguous and multidimensional contexts are likely to confound the interpretation of the association between an alcoholic beverage itself and appetitive responses.

Aside from potential miscategorization, the GAAP images also include labels on beverage containers, a major concern, as previously noted, in that experiences with brands may result in biased responding. Even if researchers did want to include popular brands as an intentional component of their studies, some alcoholic beverages captured are common in the United States (e.g., Smirnoff), and others more common in Europe would likely need to be excluded (e.g., Orval, Diekirch). As pictures need to be excluded from use, the number of supplemental images from elsewhere will likely increase, which the authors were explicitly trying to avoid.

Many scenes in the GAAP contain actors, and although researchers ensured no facial expressions were captured, it is unknown whether the behaviors of these people carry affective weight (e.g., two hands toasting mugs of beer). Indeed, many previous studies (Carter & Tiffany, 2009; Loeber et al., 2007; Mucha et al., 2000; Petit et al., 2012; Stritzke et al., 2004; Townshend & Duka, 2001) include a “party scene” or “casual drinking” depiction with images of alcohol. Importantly, a marketing study demonstrated that facial expressions of people in advertisements contribute highly to the message of the ad, and play a role in how pleasing and arousing the advertisements are to participants (Poels & Dewitte, 2008). This concern was shared by Stritzke et al. (2004) in the creation of the NAPS, who used the term “contextual noise” to describe multidimensional cues. The variety of content depicted in the GAAP makes it difficult to ascertain precisely what salient features of the image participants have responded to.

Given the above limitations, a new standardized set of stimuli capable of eliciting an approach response to only alcoholic beverage content is warranted to investigate the approach tendencies elicited by the beverage itself among college drinkers.

Cue Reactivity to Images of Alcohol: Study 1

In an effort to reduce error and improve consistency in the cue reactivity literature, we were interested in exploring valence and arousal ratings for a variety of alcoholic beverages, and determine if certain beverages could be collapsed across categories, as is standard procedure with IAPS images. When examining alcoholic beverages studied in the literature to date, some studies show images of beer, wine and liquor without a rationale for the selection (e.g., Mucha et al., 1999; Mucha et al., 2000; Pulido et al., 2010; Stritzke et al., 2004). Others only include images of beer (e.g., Carter, 2011; Drobes et al., 2009), as it is considered to be the most widely consumed alcoholic beverage in college populations (Snortum, Kremer & Berger, 1987; Wechsler, Kuo, Lee & Dowdell, 2000). In terms of the content of alcohol images, beverage type may be especially influential in reactivity (Drobes et al., 2009), further supporting an examination of which beverages are most appropriate to include. Although researchers commonly combine alcohol images in their analyses, there is no empirical justification for assuming consistent responding across beverage differences. Therefore, if researchers decide to show more than just beer, it is unknown presently whether collapsing across beverage type is a psychometrically sound practice. Study 1 was conducted to examine potential differences in markers of reliability across beverage type.

Alcohol images for the picture set used in Study 1 came from a stock photo website, Shutterstock (http://www.shutterstock.com). To keep the images consistent, inclusion criteria

required a plain white background with no connotation of setting or location and no people in the photo. To avoid potential contamination, as previously mentioned, people and brands were purposely excluded from the photographs in our study.

Three types of alcoholic beverages were included in the Study 1 picture set: (1) Beer, (2) Wine, and (3) Liquor (e.g., mixed drinks, straight shots of different types of liquor). Additionally, within each of the alcohol type categories, pictures captured either single or multiple servings of alcohol; thirty of the alcohol images were of single servings of alcohol (e.g., a single glass of wine, a single martini), and the other thirty alcohol images were of multiple servings of alcohol (e.g., a pitcher of beer, multiple shots of liquor).

To compare the internal consistency of the alcohol images with other commonly used slides in the study of approach and avoidance, pictures for the Positive, Negative and Neutral categories were obtained from the IAPS image bank. Within the Positive and Negative affective categories, an effort was made to ensure that a wide range of stimuli were represented as follows: in the Positive category, images with content including babies, adventure scenes (e.g., people on a roller coaster, jet skiing), pleasant animals (e.g., puppies, kittens) and erotic couples were included. In the Negative category, images with content including victims (e.g., human mutilation, injury), self-threat (e.g., gun pointed toward the viewer), and other-threat (e.g., aggression toward another person) were included. The images described above are provided in Table 1.

Methods

Participants

Ninety-three college students enrolled at a large private institution in the northeastern United States participated in Study 1 in exchange for credit in an introductory psychology course. Ten participants were excluded from analyses as a result of their failure to follow task protocol; these participants fell asleep during the picture-rating task. The 10 participants excluded did not differ from included participants with respect to gender [χ^2 (1, N = 93) = .12, p = .73], or average number of reported drinks per week [F(1,89) = 0.22, p = .64]. However, excluded participants did significantly differ with respect to ethnicity; a higher proportion of Caucasians were included (63.9%) relative to participants who were excluded (30.0%) [Likelihood ratio (7, N = 93) = 15.81, p = .03] [1]. Participants also significantly differed in age [F(1,89) = 10.76, p = .001], such that those included had a *M* age of 19.25 (SD=2.0), and those excluded had a *M* age of 22.8 (SD=8.3).

The sample available for analyses included 83 college students [45 women, *M* age 19.25 (SD=2.0), 63.9% Caucasian] with an average alcohol consumption of 6.4 drinks per week (SD=7.1). Participants in Study 1's sample most frequently reported a preference for beer (31.3%) followed by wine (20.5%), straight shots (19.3%), and cocktails (14.5). No preference was indicated by 6% of the sample, and 8.4% circled more than one preference.

Picture Set

Picture set category distribution was as follows: 60 affective images (20 positive, 20 negative, 20 neutral) and 60 alcohol images (20 beer, 20 wine, 20 liquor). Alcohol images for the

[1]Likelihood ratio was used since the Pearson's χ^2 analysis of ethnicity violated assumptions of expected cell count.

picture set used in Study 1 came from a stock photo website, Shutterstock (http://www.shutterstock.com), and affective images were obtained from the IAPS image bank. Although there were 120 pictures included in total, participants were only shown 60 images at a time to prevent fatigue (Pulido et al., 2010). Therefore, two different versions of the image presentation were created and shown in different experimental sessions by random assignment. Pictures were matched so that both Version 1 and Version 2 were highly similar in terms of content. As listed in Table 1, the order in which images from each subcategory were presented was identical between Version 1 and Version 2, that is, if the 4th image shown in Version 1 was a single beer, the 4th image shown in Version 2 was also a single beer, for instance. This continuity was maintained for all 60 images shown across both versions of the picture presentation to ensure that participants saw highly similar images in the exact same sequence despite randomly being assigned to one version or another.

Self-Report Measures

Demographic Questionnaire. A brief demographic questionnaire was distributed including items such as age, gender, class year (e.g., sophomore) and ethnicity, estimated number of alcoholic drinks consumed per week, as well as one item pertaining to preferred alcoholic beverage. The alcohol preference item asked, "Which of the following alcoholic beverages do you prefer? Pick one." The available choices were Beer, Wine, Mixed Drinks, or Straight Shots.

Self-Assessment Manikin. Self-Assessment Manikin (SAM) graphically represents the critical affective dimensions of valence and arousal (see Russell, 1980) separately by showing a series of five manikin figures ranging from smiling to frowning (valence) and excited to calm

(arousal). Each graphical dimension was accompanied by a scale with the numbers 1-9 appearing on or between figures, such that the lower the number, the more positive (valence) or excited (arousal) the reaction. Participants were asked to indicate how the picture "makes you feel when you view it" by circling one of these numbers (Bradley & Lang, 1994). A study comparing reliability with participants under 21 compared to participants over 21 found alpha coefficients to be .63 and .82 respectively for valence, and .98 for both age groups regarding arousal. The authors noted that the lower consistency for younger adults is likely attributable to more variable emotional reactions to neutral images (Backs, de Silva & Han, 2007).

Procedure

Upon arrival to the experiment site, participants were greeted and informed that the purpose of the study was to better understand individual reactions to images of alcohol. They were then asked to carefully read the Informed Consent Form and upon agreement to participate, provide their signature. Once the informed consent was completed, participants were asked to complete a brief questionnaire containing demographic items.

Following completion of the self-report measures, participants were asked to open their SAM booklets. Lights were dimmed, and participants were instructed to direct their attention to the projector screen. The researchers described the picture-viewing task, and that when a picture is presented, participants should attend to it during its entire presentation. Each trial included three components: 1) a preparation slide presented for 3s stating "Please be ready for the next side;" 2) a stimulus picture presented for 6s; and 3) a SAM rating slide presented for 11s asking participants to rate how the picture made them feel while viewing it. Stimuli were presented via E-Prime 2.0 software (Psychology Software Tools, Pittsburgh, PA) running on a laptop

computer. After a practice trial where participants practiced rating three images (one positive, one negative, one liquor), each participant rated the 60 experimental pictures using the SAM booklets. The experimental pictures shown were either Version 1 or Version 2 of the picture set; the version viewed was based on random assignment.

To conclude the experiment, participants were individually debriefed and thanked for their participation in the study. Referral to relevant resources was offered to all participants, with the preface, "It may be useful to you or someone you know in the future, and is a great resource to have on hand should alcohol use become problematic." Participation credits commensurate with time spent at the study were granted immediately following the experiment.

Results

Using each participant's SAM ratings for valence and arousal, mean rating values were calculated for each image category (see Table 2 and Table 3). GLM analyses were performed to test between-subjects effects of Version (whether participants were randomly assigned to Version 1 or Version 2) on mean SAM ratings (valence and arousal) for each image category. Results indicated that there were no significant main effects of Version on arousal ratings for any of the image categories (Table 3), so that the average arousal response evoked by any given image category did not differ based on which picture set version participants were randomly shown. However, two significant main effects of Version on valence ratings were observed (Table 2): for Positive images [$F(1,59) = 8.77$, $p = .004$] and Single Liquor images [$F(1,59) = 4.29$, $p = .04$], such that the average affective response evoked by these image categories did differ between Version 1 and Version 2; images were rated as more pleasant in Version 2 compared to Version 1 for both Positive and Single Liquor categories.

To evaluate the degree to which images from each category consistently evoked a similar response, Cronbach's alpha coefficients were calculated for both valence and arousal in each picture category (see Table 2 and Table 3). Results for Version 1 indicated that the inclusion of both mixed drinks and straight shots in the greater category of Liquor Images is appropriate for cue reactivity research, as the alphas for this category were high for both valence (alpha = .83) and arousal (alpha = .93). Beer (alpha = .94 valence, .96 arousal) and Wine (alpha = .94 valence, .95 arousal) were also found to be highly internally consistent for Version 1 of the picture set. When all three types of alcoholic beverages were collapsed into a single category of Alcohol, internal consistency was also good (alpha = .96 valence, .98 arousal). These findings were highly similar in Version 2 of the picture set, as depicted in both Table 2 and Table 3.

Discussion

The findings in Study 1 provided support for using more than just beer in cue reactivity studies using college samples, as has been the technique in several previous studies (e.g., Carter, 2011; Drobes et al., 2009). All three beverage categories were capable of evoking an approach response as indicated by positive affective ratings on the SAM. Moreover, researchers can analyze reactivity to images of different categories of alcohol both separate and combined; support was found in Study 1 for collapsing across different types of alcoholic beverages when analyzing affective responses as internal consistencies were highest when combined together under Alcohol (Version 1 alpha = .96 valence, .98 arousal) rather than individually as Beer (Version 1 alpha = .94 valence, .96 arousal), Wine (Version 1 alpha = .94 valence, .95 arousal), and Liquor (Version 1 alpha = .83 valence, .93 arousal). These high internal consistencies for

both Version 1 and Version 2 demonstrated that the novel images selected from Shutterstock.com evoke reliable responses, justifying their continued use in future studies.

Despite the above findings, Study 1 also revealed some potential concerns. Single Liquor images failed to meet reliability standards regarding valence, indicating that the images selected for this category were unreliable for valence ratings. This finding was not observed for arousal ratings, where internal consistency of Single Liquor images was high. The lack of consistency of Single Liquor images regarding valence was further supported by a main effect of version on valence ratings, illustrating that valence ratings significantly differed based on which version of Single Liquor slides were viewed. Study 1 collapsed straight shots and cocktails into a single category of Liquor, as had been done in previous studies. When including this category of alcoholic beverages, many researchers use the ambiguous label "hard liquor" or "liquor" assuming both straight shots and cocktails show equivalent cue-reactivity effects (Lindgren, Westgate, Kilmer, Kaysen & Teachman, 2012; Pulido et al., 2010; Strizke et al., 2004) . However, the lack of reliability and difference between versions suggest that individual drinks within the Liquor category produce variable affective and arousal responses. It can be concluded that the different types of liquor drinks depicted in the Single Liquor category were so different that they contributed to the unreliability of the valence ratings. This conclusion seems logical considering the range of liquor drinks included (e.g., a strawberry daiquiri and a shot of tequila did not produce equivalent valence reactivity ratings).

Importantly, despite differences on an individual level, when Single Liquor and Multi Liquor categories were collapsed together into the combined category of All Liquor, psychometrics improved; not only did internal consistency for valence increase from the 0.65 observed for Single Liquor to 0.83 for All Liquor, but the significant main effect of Version on

valence ratings also disappeared. These findings demonstrate that unlike other beverage categories, types of beverages depicted in the Liquor category produce more variable affective responses on an individual basis. However, these differences disappear when collapsed together and produce much more reliable responses when taken together, rather than individually. Future studies should keep this in mind when selecting images to use in picture sets, and in an attempt to increase reliability of their methods, use All Liquor rather than highly variable Single Liquor images.

The unexpected main effect of version on valence ratings for Positive images may have a much more straightforward explanation. Unlike the Single Liquor category which had an internal consistency below acceptable standards in Version 1 (alpha = 0.65), Positive images produced consistent affective responses across participants (Version 1 alpha = 0.78) which exceeded reliability standards (see Table 2). In other words, affective responses did not vary greatly between items within versions, just the collapsed item averages between versions. Despite efforts to match highly similar images between versions, closer examination of content within the Positive image category in Study 1 revealed that subcategories were unequally distributed between versions; Version 2 had 3 baby images and 1 animal image, and Version 1 had 1 baby image and 3 animal images. To correct for these differences in Study 2, Positive1601 from Version 1 will be swapped with Positive2165 from Version 2, resulting in 2 babies and 2 animals in each version. This change was expected to eliminate the significant main effect of version on valence ratings for Positive images that was observed in Study 1.

Cue Reactivity to Images of Alcohol: Study 2

Study 2 improved upon Study 1 by evaluating additional psychometric properties and further assessing the appetitive nature of the images of alcohol. Internal consistency reliability was examined to add to our investigation of the psychometric properties of the slides. Convergent validity was also assessed; if the intent of the picture set is to measure appetitive responses to images of alcohol, other measures of appetitive responses to alcohol should correlate with reactions to the image set. Therefore, Study 2 aimed to compare valence responses to alcohol images to the following markers of approach: the Alcohol Timeline Followback (Sobell & Sobell, 1992), the Approach and Avoidance of Alcohol Questionnaire (McEvoy, Stritzke, French, Lang & Ketterman, 2004), and the Comprehensive Effects of Alcohol Scale (Fromme, Stroot, & Kaplan, 1993). To demonstrate divergent validity, the alcohol appetitiveness measures should not correlate with any of the IAPS affective image responses (e.g., Positive, Negative, Neutral) for both valence and arousal. These images are not linked to alcohol content, and therefore, should not correlate with alcohol self-report measures.

It is noteworthy that recent research shows valence and arousal to activate different cortical regions (Colibazzi et al., 2010; Lewis, Critchley, Rotshtein, & Dolan, 2007; Posner et al., 2009), thereby supporting Feldman, Barrett and Russell's (1999) assertion that valence and arousal are separate entities. However, other studies have found evidence for an integrated model where valence and arousal overlap (Citron et al., 2014; Feng et al., 2012). Consequently, the possibility of both valence and arousal showing similar associations with the self-report markers of approach was explored.

A second aim in addition to those aims noted above was to narrow the 120 pictures across both Version 1 and 2 down to a final set of 60 standardized images. This size is quite standard

for cue reactivity studies, which typically range between 40-60 pictures depending on the content included (Drobes et al., 2009; Mucha et al., 2000; Pulido et al., 2010; Strizke et al., 2004). Valence ratings were compared within categories using a cross sample comparison of item-total correlations. This analysis determined which 10 pictures across both versions of the picture set were the best fit; we were seeking the most psychometrically sound images from each of the 6 image categories for a total of 60 final standardized images.

Methods

Participants

The current study sampled 163 participants (82 women, *M* age 18.8 (SD= 1.41), 59.3% Caucasian) enrolled at a large private institution in the northeastern United States. This sample participated in exchange for credit in an introductory psychology course, and had not been previously enrolled in Study 1. Average alcohol use for the sample was 10.6 drinks per week (SD=11.5). Participants in our sample most frequently reported a preference for liquor (49.7%) followed by beer (31.1%) and wine (19.3%).

Picture Set

The current study used the same picture set that was used in Study 1, comprised of alcohol images from Shutterstock and affective images from the IAPS (see Table 1). As in Study 1, image categorization was as follows: 60 affective images (20 positive, 20 negative, 20 neutral) and 60 alcohol images (20 beer, 20 wine, 20 liquor). As previously noted, to correct unwanted main effects observed in Study 1, Positive1601 from Version 1 was swapped with Positive2165 from Version 2, resulting in 2 babies and 2 animals in each version used in Study 2. This change

was expected to eliminate significant main effect of version on valence ratings for Positive images that was observed in Study 1 (see Table 2).

Self-Report Measures

Demographic Questionnaire. A brief demographic questionnaire was distributed including items such as age, gender, class year (e.g., sophomore) and ethnicity, as well as one item pertaining to preferred alcoholic beverage. The alcohol item asked, "Which of the following alcoholic beverages do you prefer? Pick one." The available choices were Beer, Wine, or Liquor. As Study 1 provided justification for combining images of cocktails and straight shots, their availability as separate preferences on the demographic questionnaire was eliminated and the two were consolidated into Liquor. The addition of the words "pick one" in the directions was intended to reduce the number of participants that indicate several preferences.

Timeline Follow-Back. The Alcohol Timeline Follow-back (TLFB) is a measure that assesses alcohol use through the use of a blank calendar (Sobell & Sobell, 1992). Participants were asked to retrospectively estimate their daily alcohol consumption for the seven days prior to their study participation. High test-retest reliability has been demonstrated, with coefficients ranging from .79 to .96 (Sobell & Sobell, 2000). Variables gained from this measure included days drinking (number of days in one week where alcohol consumption occurred), average drinks per drinking day (on those days in which drinking occurred, the average number of drinks that were consumed per drinking occasion), number of binge drinking days [number of days in which 4 or greater drinks for females, or 5 or greater drinks for males, were consumed (NIAAA, n.d.)], and total drinks per week (sum of all alcoholic beverages consumed in seven days prior to participation). These variables were generated for each participant.

Approach and Avoidance of Alcohol Questionnaire. The Approach and Avoidance of alcohol Questionnaire (AAAQ) is a 14-item measure that assesses inclinations to drink and not to drink over the previous week (McEvoy, Stritzke, French, Lang & Ketterman, 2004). Participants were asked to rate the degree to which they agree with the items on a 9-point scale (0 = not at all, 8 = very strongly). Items fall under three subscales: Inclined/Indulgent (mild approach), Obsessed/Compelled (intense approach), and Resolved/Regulated (avoidance). McEvoy et al. report that internal consistencies for the subscales are moderate to high, with alpha coefficients ranging from .72 to .89.

Comprehensive Effects of Alcohol Scale. The Comprehensive Effects of Alcohol Scale (CEOA) is a 38-item measure that assesses positive and negative effects of alcohol (Fromme, Stroot, & Kaplan, 1993). Participants were asked to rate expectancies of alcohol intoxication on a four-point scale (1 = disagree, 4 = agree). Positive items fall under subscales of Sociability, Enhanced Sexuality, Liquid Courage, and Tension Reduction. Negative items fall under Risk and Aggression, Cognitive and Behavioral Impairment, and Negative Self-perception. The CEOA has been found to have adequate internal reliability for some subscales, with alpha coefficients for subscales ranging from .59 to .89 (Fromme & D'Amico, 2000). Test-retest reliability of the scales was also adequate (r = .66 to .81). Authors note that the psychometric properties of this measure is comparable to others available with the advantage of short length and Likert responses, which are more sensitive than a dichotomous format.

Self-Assessment Manikin. The Self-Assessment Manikin (SAM) graphically represents the critical affective dimensions of valence and arousal (see Russell, 1980) separately by showing a series of five manikin figures ranging from smiling to frowning (valence) and excited to calm (arousal). Each graphical dimension was accompanied by a scale with the numbers 1-9

appearing on or between figures, and participants were asked to indicate how the picture "makes you feel when you view it" by circling one of these numbers (Bradley & Lang, 1994).

Procedure

Upon arrival to the experiment site for the procedure, participants were greeted and informed that the purpose of the study was to better understand individual's reactions to images of alcohol. They were then asked to carefully read the Informed Consent Form and upon agreement to participate, provide their signature. Once consent was completed, participants were asked to complete a brief questionnaire containing demographic items, the TLFB, the AAAQ, and the CEOA.

Following completion, participants were asked to open their SAM booklets. Lights were dimmed, and participants were instructed to direct their attention to the projector screen. The researchers described the picture-viewing task, and that when a picture is presented, participants should attend to it during its entire presentation. Each trial included three components: 1) a preparation slide presented for 3s stating "Please be ready for the next side;" 2) a stimulus picture presented for 6s; and 3) a rating slide presented for 11s asking participants to rate how the picture made them feel while viewing it. Stimuli were presented via E-Prime 2.0 software (Psychology Software Tools, Pittsburgh, PA) running on a laptop computer. After a practice trial where participants practiced rating three images, each participant rated 60 experimental pictures using the SAM booklets. The experimental pictures shown were either Version 1 or Version 2 of the picture set.

To conclude the experiment, participants were collectively debriefed and thanked for their participation in the study. Referral to relevant resources was offered to all participants, with

the preface, “It may be useful to you or someone you know in the future, and is a great resource to have on hand should alcohol use become problematic.” Participation credits commensurate with time spent at the study were granted immediately following the experiment.

Results

Reliability Analyses

Internal Consistency. To examine internal consistency reliability, Cronbach’s alpha coefficients were calculated for each of the image categories (see Tables 4 and 5). Results indicated that each of the alcohol image categories demonstrated high internal consistency for valence ratings, including Beer [Version 1 (V1) alpha = .95; Version 2 (V2) alpha = .94], Wine (V1 alpha = .92; V2 alpha = .93), Liquor (V1 alpha = .90; V2 alpha = .80), and when collapsed across all Alcohol images (V1 alpha = .96; V2 alpha = .95). Internal consistency of alcohol image categories were also high for arousal ratings, including Beer (V1 alpha = .96; V2 alpha = .94), Wine (V1 alpha = .96; V2 alpha = .95), Liquor (V1 alpha = .94; V2 alpha = .93), and when collapsed together as All Alcohol (V1 alpha = .98; V2 alpha = .98).

Between-Subjects Tests of Version on Ratings. To test whether the corrections made in the Positive images category eliminated the unwanted main effect of version on valence ratings observed in Study 1, a GLM test of between-subjects effects was performed to examine differences between-subject effects of version on mean SAM ratings (valence and arousal) for each image category. No significant differences in mean valence ratings were observed for any image category, including Positive images (Table 4). However, one unexpected main effect did emerge for version (categorical) on arousal ratings (continuous): Beer images arousal ratings [$F(1, 150) = 4.12$, $p < .05$] (Table 5).

To better understand this main effect of version on ratings, additional exploratory GLM analyses were performed to examine significant individual differences that may exist between participants randomly assigned to different versions of the picture set (Table 10). When version served as the categorical variable and self-report measures served as continues variables, there were no significant differences in demographic characteristics or alcohol expectancies. However, two significant differences between participants in each version did emerge: score on the Compelled Approach scale (V1 mean = 1.38; V2 mean = .9, $p = .04$) and number of binge drinking days (V1 mean = 1.34; V2 mean = .88, $p = .04$). Separate one-way ANOVAS with Beer arousal ratings as the continuous variable revealed a significant effect of number of binge drinking days (categorical) on Beer arousal [$F(6, 143) = 4.61$, $p < .01$]. The main effect of Compelled approach on ratings for Beer arousal [$F(20, 131) = 1.23$] failed to achieve significance (see Table 10).

Convergent Validity Analyses

Alcohol Valence and Expectancies. To examine convergent validity, Pearson's product moment correlation coefficients were calculated for each of the alcohol self-report measures and SAM valence ratings for the collapsed All Alcohol images category within each time period (see Table 6). As hypothesized, a significant inverse correlation was obtained between positive expectancies on the CEOA and All Alcohol valence ratings (V1 $r = -.22$, $p < .05$) in Version 1, demonstrating that participants with positive expectancies rated alcohol images more positively. This association failed to replicate for Version 2.

Alcohol Valence and Alcohol Consumption. Significant correlations (all *p's* < .05) were also obtained for each of the TLFB alcohol consumption measures, including number of

drinking days per week (V1 r = -.30; V2 r = -.46), average number of drinks consumed per drinking day (V1 r = -.46; V2 r = -.39), number of binge drinking days (V1 r = -.35; V2 r = -.42), and total number of drinks per week (V1 r = -.41; V2 r = -.47). Each of these associations were consistent across versions of the picture set (see Table 6), indicating that participants with greater/more frequent behavioral reports of alcohol use rated alcohol images more positively.

Alcohol Valence and Approach toward Alcohol. Analyses also revealed significant correlations between the SAM valence ratings for alcohol images and two different approach subscales from the AAAQ, indulgent, (V1 r = -.35; V2 r = -.51, $p < .01$) and compelled approach (V1 r = -.40; V2 r = -.36, $p < .01$), demonstrating that participants with a greater tendency to approach alcohol rated images of alcohol more positively. For Version 2, regulated approach significantly correlated with alcohol valence ratings such that individuals who highly avoid alcohol also rated images of alcohol as highly unpleasant. This correlation trended in the correct direction for Version 1 yet failed to achieve significance.

Exploratory Analyses

Alcohol Arousal and Approach Measures. As exploratory analyses, correlation coefficients were calculated for each of the approach toward alcohol measures and Alcohol image arousal ratings (see Table 6). Significant correlations were found for TLFB alcohol consumption measures including average number of drinks consumed per drinking day (V1 r = -.21, $p < .05$; V2 r = -.41, $p < .01$), number of binge drinking days (V1 r = -.22; V2 r = -.26, $p < .05$), and total number of drinks per week (V1 r = -.23; V2 r = -.26, $p < .05$). These findings indicate that participants with greater behavioral reports of alcohol use rated alcohol images as more exciting. Each of these associations were consistent across versions of the picture set

except days where drinking occurred, which was only significant for Version 1 (V1 r = -.20; $p < .05$).

Correlations failed to meet significance between Alcohol arousal ratings and measures of expectancies (see Table 6). However, results indicated significant correlations between alcohol arousal and indulgent approach for Version 2 alone (V2 r = -.44, $p < .01$). For compelled approach, each version observed significance at (V1 r = -.21; V2 r = -.26, $p < .05$).

Divergent Validity Analyses

In an effort to demonstrate divergent validity, correlation coefficients were calculated for each of the alcohol approach measures and the IAPS categories. As the IAPS relates to an overall appraisal of neutral, positive and negative reactions not linked to alcohol content, the valence & arousal IAPS ratings were not expected to be correlated with the self-report alcohol approach measures. As shown in Table 7 and Table 8, no significant correlations were found between IAPS Positive or IAPS Negative image valence ratings and any of the approach toward alcohol measures.

One unexpected significant association was obtained between valence ratings of IAPS Neutral images and one of the approach toward alcohol measures (see Table 9). Although the ratings failed to reach significance with TLFB measures, they did significantly correlate with Compelled Approach (V1 r = .21, $p < .05$), so that the greater one's intense approach toward alcohol, the more negatively they rated Neutral images.

As shown in Tables 7-9, each of the alcohol approach measures failed to consistently significantly correlate with SAM arousal ratings for IAPS Positive, Negative, and Neutral images except for four instances: IAPS Positive arousal ratings significantly correlated with indulgent

approach (V2 r = -.27, $p < .05$). IAPS Negative arousal ratings significantly correlated with negative expectancies (V2 r = .27, $p < .05$) and total drinks per week (V1 r = -.20, $p < .05$), and IAPS Neutral arousal ratings significantly correlated with average number of drinks per day (V2 r = -.29, $p < .05$).

Final Picture Selection Analyses

To determine which individual pictures were the best fit for each image category, item-total statistics were calculated in reliability analyses in SPSS. Although these statistics were calculated for both valence and arousal, the primary intention of the picture set was to elicit an approach response, not self-reported arousal. As such, we examined the Cronbach's alpha coefficient for valence ratings only that would result if each individual image were removed from the picture set. As an initial elimination procedure, any images that would increase the internal consistency of valence of the picture category as a result of its removal were in fact removed to enhance categorical cohesion. This elimination procedure resulted in the removal of 10 individual pictures from the picture set and out of consideration. We then examined valence item-total correlations for the remaining images, and selected the 10 images from each category that had the highest correlation coefficients. A list of our final set of standardized images can be found in Table 11.

Discussion

The current study aimed to develop a new psychometrically sound standardized set of images for use in future alcohol cue reactivity research studies. In order to do so, we analyzed several measures of reliability and validity. Tests of internal consistency replicated the findings of Study 1 in that the images of alcohol had strong reliability for both valence and arousal. These

findings provide further support for the inclusion of our images of alcohol in future studies as they produce consistent appetitive reactions.

Analyses of between-subjects effects of picture set version on SAM ratings revealed that the correction made for Study 2 did in fact eliminate the unwanted main effect of version on Positive valence ratings that was observed in Study 1; recall that Positive1601 from Version 1 was swapped with Positive2165 from Version 2, resulting in 2 babies and 2 animals in each version. In Study 1, SAM ratings for images of alcohol did not significantly differ between versions of the picture set, which suggested that images included in different versions did not produce different responses affective responses.

Unexpectedly, in Study 2 there was a significant main effect of version on Beer arousal ratings. Further tests of between-subjects effects were only able to shed light on two individual differences in participants that may explain the difference in Beer image arousal: compelled approach and number of binge drinking days. Participants who viewed Version 1 of the picture sets had higher compelled approach scores, more frequently participated in binge drinking, and rated Beer images as more arousing than participants who viewed Version 2. Although this finding was unintended and potentially due to differences in group-version characteristics, the main purpose in creating this picture set was to evoke an approach response via valence reactions, and so unexpected findings regarding arousal reactions do not hinder the success of this aim. Rather, these findings provide an area for future study regarding the role of individual differences in cue reactivity to images of alcohol.

In addition to the specific unique relationship between number of binge drinking days and Beer arousal, later exploratory analyses demonstrated a main effect of binge drinking on

Beer arousal in that one's self-reported arousal while viewing images of beer varied systematically based on how frequently those individuals engaged in binge drinking behavior. These results further suggest that behavioral measures of approach toward alcohol have an important relationship to self-reported arousal while viewing images of alcohol, which may be particularly strong for arousal toward Beer images. With our specific sample, participants most frequently reported a preference for liquor. Yet despite an overall tendency for our sample to prefer drinking liquor, participants who participate in binge drinking reported greater arousal toward Beer images.

Tests of convergent validity showed significant correlations of rated alcohol slide valence and self-report measures thought to reflect behavioral approach. Measures of frequency of alcohol use, number drinks consumed each time drinking occurred, total number of alcoholic drinks consumed per week, and number of binge drinking days all significantly associated with a positive appraisal valence (viz., lower negative valence ratings) of the alcohol images. These findings were in agreement with the second aim of our study, which was to evaluate the convergent validity between reactions to our alcohol images to valence ratings and other measures of an approach response toward alcohol. Two approach subscales from the AAAQ were found to be associated with valence ratings for alcohol images; indulgent and compelled approach, in that the stronger one's tendency to either mildly or strongly approach alcohol, the more pleasant one reported images of alcohol.

Alcohol valence reactivity was significantly correlated with positive expectancies of alcohol in Version 1 alone, such that the greater participants' belief that drinking alcohol will produce positive effects, the more pleasant participants rated images of alcohol. Several previous studies support our finding (e.g., Carter, 2006; Carter, 2011), particularly Drobes, Carter, and

Goldman (2009) who found that participants with greater positive and social expectancies of alcohol rated images of alcohol as more pleasant and arousing. However, when it came to psychophysiological reactivity, neither early nor late startle response was significantly correlated with alcohol expectancies. Our association between alcohol valence and positive expectancies failed to replicate in Version 2, further emphasizing the need to continue to study the variability in reactivity to images of alcohol.

Regarding exploratory analyses of alcohol image arousal, participants in both versions who scored highly on compelled approach also rated images of alcohol as more arousing. Similarly, individuals who reported greater arousal toward Alcohol also scored highly on TLFB measures of average drinks per drinking day, binge drinking days, and total drinks per week. Comparatively, expectancies of alcohol failed to correlate with alcohol slide arousal ratings, suggesting that perhaps one's behavioral tendency to approach alcohol may show stronger associations with expectancy than slide ratings of arousal. Additional research is warranted to replicate these exploratory findings and support their reliability.

In analyzing divergent validity between the approach measures and affective IAPS images, results indicated that as expected, one's degree of approach toward alcohol is unrelated to SAM valence ratings of both Positive and Negative IAPS images. However, an unexpected finding emerged regarding Neutral image valence ratings: individuals with greater tendency to approach alcohol on the AAAQ Compelled Approach scale viewed Neutral images in Version 1 more negatively. A study that examined internal consistency of IAPS images found lower internal consistency values for neutral images in a population of younger adults (Backs, de Silva & Han, 2007). Authors attributed this discrepancy to variable emotional reactions to Neutral images, something that was not observed for other affective image categories. Our finding my

reflect that responding to Neutral images may be less reliable than other IAPS categories, yet it is still unclear why Compelled Approach individuals who viewed Version 1 of the picture set found Neutral images more unpleasant.

To narrow down the final set of standardized stimuli, valence ratings were compared within categories using a cross sample comparison of item-total correlations. This computation determined which pictures were the best fit for each image category by selecting individual images with the highest correlations to the image category itself. As each image category should be equally represented in the final standardized picture set, we sought to narrow down 120 original images to 60. This produced a standardized picture set appropriate in size for future startle studies with the aim of preventing fatigue in participants.

In summary, the current study demonstrated that our standardized picture set has psychometrically sound properties associated with respect to an approach valence. In general, positive valence SAM ratings showed acceptable internal consistency reliability and convergent validity with other measures of approach toward alcohol, particularly behavioral indices, including frequency of alcohol consumption, average number of drinks consumed per drinking day, and total drinks consumed per week. These findings suggest that our alcohol images were associated with producing an approach response. Unexpected findings that emerged in exploratory analyses revealed a main effect of binge drinking on Beer image arousal, demonstrating a potentially important factor to consider when recruiting participants as greater binge drinking predicts greater arousal toward images of beer. Some divergent validity was established as evidenced by the majority of measures of approach toward alcohol being unrelated to IAPS image categories. Yet, some unexpected findings emerged, suggesting that some other individual differences may be factoring into reactivity. It is unknown whether or not these

significant correlations were spurious, and so future studies are needed to confirm or deny their existence and help identify what factors contribute.

Additional research is warranted to replicate and extend our findings that behavioral markers of approach tend to relate highly to one's valence appraisal of alcohol, yet do not fully explain one's arousal toward alcohol. The area of research examining the role of internal-states on variable cue reactivity is limited, yet growing (e.g., Cooney et al., 1997; Ivory, Kambouropoulos & Staiger, 2014; Kambouropoulos & Staiger, 2004) and may continue to add to our understanding of the multidimensional nature of how individuals process alcohol cues. In a non-clinical population, heavy drinkers sensitive to reward displayed greater positive affect when presented with alcohol cues (Kambouropolous & Staiger, 2001). What is unknown, however, is whether these findings can be replicated in a college population using images from the current study that capture alcohol alone, not alcohol-associated stimuli (e.g., a bar setting, alcoholic beverages on a table). Perhaps psychophysiological studies of cue reactivity may help us understand the discrepancy between behavior and internal-states in predicting one's cue reactivity to alcohol (e.g., showing that, despite one's beverage of choice, Beer images may induce the greatest reduction in eye blink startle, for instance).

Limitations

The current study has some limitations. First, one should consider the possibility that some alcoholic beverages displayed in the study may not be realistically accessible to underage college students. For example, when at a party, underage students may have easy access to beer and bottles of liquor. It is less likely that underage drinkers are consuming large quantities of expensive cocktails or wines. Recall that with our specific sample, participants most frequently

reported a preference for liquor (49.7%) followed by beer (31.1%) and wine (19.3%). Although the TLFB provided measures of alcohol consumption and pattern, it did not provide information about what was actually being consumed. So perhaps in our sample, one's preference does not perfectly map onto what they are truly drinking. Nonetheless, future studies may consider what their participant demographic is drinking, whether preferences differ, and only use those beverage images pertinent to their sample. This can be accomplished by collecting data on a 30 day TLFB (instead of the 7 day window used in the current study) and including additional items to clarify not only consumption patterns, but specific types of beverages consumed on those occasions.

Perhaps the chief limitation is that an unequal number of participants viewed each version of the image sets; 102 viewed Version 1 and 61 viewed Version 2. Due to experimental error, several timeslots that were intended to use Version 2 of the picture set incorrectly used Version 1 instead, an error that was not discovered until after the study had closed. Several associations reported in the current study did not replicate across versions, perhaps because of different sample sizes and across conditions. Another possible explanation for inconsistency is error; the numerous analyses performed in this study likely inflated Type I error rates. As such, some significant findings may be spurious. Perhaps if replicated in a future study with randomization and recruitment to ensure random assignment and even distribution across conditions, less inconsistency may be revealed.

Future Directions/Implications

The research reported here has several practical and clinical implications. Regarding practical implications, the current study offers a standardized picture set that can be utilized in

future cue reactivity studies as a method of evoking an approach response to images of alcohol and measuring individual differences in reactivity. The picture set easily lends itself to research studies using startle methodology, a psychophysiological measure that provides an objective measure of reactivity designed to supplement self-reported reactivity in research in this field. Ideally, the picture set can be made available for use to other researchers in the future to allow for cross-study comparisons to be made from the same stimuli.

Aside from the creation of this new standardized picture set and its potential to advance the field, there is still much to learn about stimulus characteristics and participant characteristics that contribute to valence and arousal. Given the availability of images of alcohol with multidimensional characteristics like those that derive from the GAAP and NAPS, future studies might fruitfully explore the extent to which cue reactivity differs between these images and the ones standardized in the current study. These studies may give us a better understanding of the degree to which different characteristics such as actors, settings, and other facets of stimuli affect reactivity to the overall image to help inform researchers in designing studies that include images of alcohol.

As previously mentioned, participant characteristics also warrant further attention in future studies. Researchers may examine an array of individual differences thought to play a role in alcohol use behaviors and study whether or not these differences account for divergent responding on measures of cue reactivity to images of alcohol. Such individual differences of interest may include mood at the time of testing, urge to drink at time of testing, and recent experiences with alcohol, to name a few. Furthermore, it would be useful to determine whether the findings using the pictures developed in the current study can be generalized to other populations, including clinical populations or populations in recovery.

Cue reactivity studies have been used to identify individuals whom are at risk for problematic drinking behavior or AUD (Carter, 2011; Fox et al., 2007; Grusser et al., 2002; Mucha et al., 2000; Sinha et al., 2009). Among U.S. college students, alcohol related deaths are on the rise (DeJong, Larimer, & Wood (Eds.), 2009), a statistic that highlights the need for continued research on effective interventions. Future studies might expand our knowledge of cue reactivity profiles of individuals at risk, perhaps as a tool in prevention and other clinical interventions. Cue reactivity to images of alcohol may prove to be a more sensitive measure of alcohol risk than behavioral measures traditionally used, helping health providers on college campuses better identify at-risk individuals and enroll them in proper interventions.

Regarding clinical implications, the current study offers the promising potential of gaining a better understanding of the underlying mechanisms of how one reacts to alcohol. There is the potential that the pictures from the current study can serve as a method of assessment to look at pre-treatment valence and arousal towards alcohol. Clients may show heightened reactivity to specific types of alcohol included in the picture set (e.g., greater arousal to images of beer) and as a result clinicians can focus treatment around that particular beverage type. Throughout the course of treatment, clinicians can assess progress by measuring changes in self-report ratings of valence and arousal, and possibly changes in psychophysiological responding as well.

Finally, we can help design interventions that alter how pleasing and arousing alcohol is to individuals with or at risk for AUD, while minimizing harm. For example, treatment studies have already used *in vivo* alcohol cues to serve as exposure stimuli, and when paired with cognitive-behavioral interventions, found promising reductions in alcohol consumption, severity of dependence, and alcohol-related problems (Dawe, Rees, Mattick, Sitharthan & Heather,

2002). Yet, there is some concern that perhaps *in vivo* exposure may be overwhelming for individuals recovering from an AUD (Strizke et al., 2004). As such, clinicians may be able to use the standardized images of alcohol in the current study to precede or replace *in vivo* cues in treatment interventions. Once we gain an understanding of how the findings in the current study replicate in clinical populations, the utility of the picture set in treatment approaches can be evaluated.

Appendix A.

SONA Sign-Up Information

Study Name: Cue Reactivity to Images

Description: The purpose of this study is to examine how individuals react to different images, including positive, negative, neutral, and alcohol images. Should you choose to participate in this study, you will be asked to complete a brief questionnaire packet including demographic information, alcohol consumption and personality factors. In the second task you will be asked to view a series of images on a projector screen and rate how the pictures make you feel.

Eligibility Requirements: 18 years & older

Duration: 1.5 hours

Credits: 1.5

Researcher: Kelsey Krueger- kmkruege@syr.edu- Psychophysiology Lab

Appendix B.

Cue Reactivity to Images-

Script & Procedures

Rev. 9/13

(Experimenters make sure the projector is working and opens the E-Prime file. Before participants arrive, experimenter has already labeled <u>Questionnaire Packets</u> & <u>Ratings Packets</u> with randomly-assigned participant #'s listed on the roster.)

(Experimenters greet participants, invite them in, and instruct them to sit at a work space with an unobstructed view of the projector screen. Experimenters should ask each participant to point to his/her name on the roster list, and then bring each participant the appropriate packets with the participant # that matches. Attendance should be taken as this check-in process occurs.)

<u>Introduction</u>

Thank you very much for your participation in the study! The purpose of this study is to better understand individuals' reactions to images of alcohol. The study is divided into two tasks. First, you'll be asked to complete a questionnaire packet. Second, you will be asked to view a series of images on a projector screen and rate how the pictures make you feel. After a short discussion about the study, your participation in the study will be complete.

1

At this point, each of you should have read our <u>Informed Consent</u> form and provided your signature at the bottom. Is that correct? **(PAUSE)** It is important to note that if at any time you decide to withdraw from the study, you will not be penalized and will still receive 1.5 credits through SONA. Please take the second copy of the <u>Informed Consent</u> form home with you at the end of the study and refer to the contact information listed if you have any further questions.

2

(Experimenters sign and collect any <u>Informed Consent</u> forms that are left.)

Now I'd like you to complete the <u>Questionnaire Packet</u> in front of you, labeled A. When you are finished, please put your pencil down and wait for further instruction.

1

(Participants start questionnaires.)

Please direct your attention to form B, the <u>PRACTICE sheet</u> and C, the <u>SAM Ratings Packet</u> in front of you. We are ready to proceed to the next part of the study. Remember, you may discontinue participation at any time without penalty.

2

* * * *

Picture Presentation

(Experimenter dims the lights.)

Now it is time for the picture presentation. When the experiment starts, a series of pictures will be shown one at a time on the projector screen in front of you. You will only have a few seconds to view each picture. It is important that you watch each picture for the entire time it is on the screen. When prompted, you will complete a scale measuring how the pictures make you feel when you view them. This scale in your Ratings Packet called the SAM, shows two different kinds of feelings: the top scale shows positive vs. negative and the bottom scale shows excited vs. calm.

Let's first look at the top scale, positive vs. negative. As you can see, this scale ranges from a smile to a frown. At one extreme of the positive-negative scale, you felt positive, pleased, satisfied, contented, hopeful. If you felt completely positive while viewing the picture, you can indicate this by circling the 1 which corresponds to the figure showing a big smile. The other end of the scale is when you felt completely negative, annoyed, unsatisfied, melancholic, despaired. You can indicate feeling completely negative by circling the 9, which corresponds to the figure showing a big frown. The figures also allow you to describe intermediate feelings of pleasure by circling the numbers that correspond to any of the other figures. For instance, if you felt completely neutral, neither positive nor negative, circle the 5.

The bottom scale, excited vs. calm, is the other type of feeling displayed here. At one extreme of the scale you felt stimulated, excited, frenzied, jittery, wide-awake, aroused. If you felt completely excited while viewing the picture, you can indicate this by circling the 1. At the other end of the scale, you felt completely relaxed, calm, sluggish, dull, sleepy, unaroused. You can indicate feeling completely calm by circling the 9. As with the positive-negative scale, you can represent intermediate levels by circling numbers that correspond to any of the other five figures. For instance, if you are not at all excited or calm, circle the 5. Let me also point out that I'm using the word excitement to refer to general excitement, be it pleasant or unpleasant. Excitement in this context simply refers to a feeling of being "worked up".

Some of the pictures may prompt emotional experiences, others may not. Your rating of each picture should reflect your immediate personal experience and no more. Please rate each one AS YOU ACTUALLY FELT WHILE YOU VIEWED THE PICTURE. There are no right or wrong answers, so please answer as honestly as you can. We are interested in your own personal ratings of the pictures, so please don't make any comments which might influence the ratings that other people make. You can understand how this might bias our results.

Each trial will include 3 components: First, a preparation slide, followed by the picture, and lastly, a slide asking you to make your ratings on your packet for the correct picture. This same procedure will take place for each picture in the presentation. It is important for you to work your way through the packet, filling out the ratings in order. Each side has a rating space in your packet with a corresponding number. If you miss a picture, leave the rating space blank, and continue when the next picture is presented.

Before we begin, here are examples of the kinds of pictures you will be viewing and rating. Right now, I'd like you to take your PRACTICE rating sheet, form B, and practice rating the following pictures, all on the same sheet. This is just to give you get a feel for how the ratings are done.

1

(Experimenter presents the practice slides.)

Do you have any questions before we begin? **(PAUSE)** Now it is time to use the SAM Ratings Packet, form C. Just a reminder before we begin; when the preparation slide comes on, make sure you are ready to begin ratings in the next available space. Then view the picture slide for the entire time it is on. After the picture is off, make your ratings on both dimensions as quickly as possible and get ready for the next picture. It is important that we have information from each of you on all of these pictures. There are no right or wrong answers, so please indicate how you actually felt while viewing the picture.

1

Alright, let's begin. **(Experimenter starts the experiment presentation. Remember to pay attention to participants who should be removed from analysis and separate their ratings at the end.)**

(Participants watch the presentation and complete SAM ratings.)

* * * *

Debriefing & Conclusion

(One experimenter passes out a copy of the Debriefing Form & Referral List.)

That just about does it! Just a few more things and you'll be done.

2

Please turn your attention to the debriefing form in front of you. This form describes what we did today, and what future studies can address. Contact information for the researchers is listed at the top, in case you have any additional questions. Also, if you'd like to receive information about the results of this study, you are welcome to provide your email address.

Lastly, please turn your attention to the referral list in front of you. Should you or anyone you know ever need help regarding alcohol use, these are locations you can turn to. Please take it with you, as this list is a great resource to have on hand should an issue ever arise.

Thank you for your participation in the study!

(One experimenter organizes self-report materials and grants SONA credit, the other stays to answer any questions participants may have.)

Appendix C.

INFORMED CONSENT FORM

Title of study: Cue Reactivity to Images

Name of researchers: Kelsey M. Krueger kmkruege@syr.edu
Cyrus Nikain canikain@syr.edu
Brittany Rodriguez bgrodrig@syr.edu
Mallory Snyder mnsnyde07@syr.edu
Nikita Ferrao mnferrao@syr.edu
Jessica Corrente jecorren@syr.edu
James Ferrante IV jaferran@syr.edu

Faculty Member: Dr. Randall S. Jorgensen rsjorgen@syr.edu
Place of study: Huntington Hall Length of participation: 1.5 Hours

The purpose of this study is to better understand individuals' reactions to images of alcohol. The study is divided into two tasks. In the first task you'll be asked to complete a brief questionnaire packet including demographic information and alcohol consumption. In the second task you will be asked to view a series of images on a projector screen and rate how the pictures make you feel. After a short discussion about the study, your participation will be complete. The entire experiment should last no more than 1.5 hours.

As a benefit associated with involvement in this research study, you may obtain knowledge of, and experience with, original scientific research. You may also gain a greater awareness of the field of emotional science, and a better understanding of how images can elicit your own emotions and capture attention.

The images that will be used in this study come from three different categories: positive, negative, neutral, and alcohol. It should be noted that the negative images may contain offensive or disturbing images such as weaponry, blood, nudity, or violence. There is a risk that the content of the images may result in mild to moderate emotional distress, however please be advised that you may refuse to take part in the research or withdraw at any time without penalty. Withdrawal will still result in full 1.5 credits earned.

Each participant will be randomly assigned a participant number to conceal one's identity in the study. The only individuals with access to data from this study will be the researchers, whom have key-access to the locked cabinet which will contain all materials, and the password to our electronic file. Materials will be cleaned of all identifying information prior to storage to further protect your identity. The researcher is not immune to legal subpoena about illegal activities. Although it is very unlikely, if law enforcement officials asked to see my data, I would have to give it to them. Please be aware that the structure of this study is group-oriented, so anonymity cannot be guaranteed. While your identity will be kept confidential among

researchers and on documents, when you participate in group research, there is risk that other participants may be able to identify you as a participant in the study.

Please sign below once you have carefully read this informed consent form, can confirm that you are at least 18 years of age, and agree to participate.

I have read the above, received a copy of this form, and I agree to participate in the above-named study.

_____
Print name (Participant)

_____
Signature (Participant) Date

_____
Print name (Researcher)

_____
Signature (Researcher) Date

If you have any further questions regarding this study, please contact the researcher listed above. Should you have any questions about your rights as a research participant, or if the participant has questions, concerns, or complaints that you wish to address to someone other than the investigator, or if you cannot reach the investigator, please contact the Syracuse University Institutional Review Board at 315-443-3013. If you experience emotional or physical discomfort due to participation in this study, please contact SU Health Services at 315-443-9005 for appropriate referrals.

A

Appendix D.

Questionnaire Packet

Appendix D.a

Please complete the following questionnaires

Gender: Male Female Trans

Age: _____

Class Status: Freshman Sophomore Junior Senior

Ethnicity:

__ Caucasian
__ African American
__ Hispanic
__ Other (please specify)
__ Asian
__ Middle Eastern
__Hawaiian/Pacific Islander

Alcoholic Beverage of Choice (most preferred, SELECT ONE):

__ Beer
__ Wine
__ Liquor

Appendix D.b

APPROACH AND AVOIDANCE OF ALCOHOL QUESTIONNAIRE (AAAQ)

This questionnaire relates to YOUR ATTITUDES toward alcohol over the LAST WEEK. Please indicate how much you agree with the statements below by circling the number corresponding most closely to your general attitude over the LAST WEEK. Your answers may range from AGREE NOT AT ALL (0) with the statement to AGREE VERY STRONGLY (8) with the statement.

I AGREE WITH THIS STATEMENT…

		Not At All								**Very Strongly**
1.	I would have liked to have a drink or two.	0	1	2	3	4	5	6	7	8
2.	I avoided people who were likely to offer me a drink.	0	1	2	3	4	5	6	7	8
3.	If I had been at a pub or club I would have wanted a drink.	0	1	2	3	4	5	6	7	8
4.	My desire to drink seemed overwhelming.	0	1	2	3	4	5	6	7	8
5.	I had planned to drink alcohol.	0	1	2	3	4	5	6	7	8
6.	I deliberately occupied myself so I would not drink alcohol.	0	1	2	3	4	5	6	7	8
7.	I was thinking about the benefits of being sober.	0	1	2	3	4	5	6	7	8
8.	I wanted to drink alcohol so much that if I had started drinking I would have found it difficult to stop.	0	1	2	3	4	5	6	7	8
9.	I would have accepted a drink if one had been offered to me.	0	1	2	3	4	5	6	7	8
10.	I avoided places in which I might have been tempted to drink alcohol.	0	1	2	3	4	5	6	7	8
11.	I was thinking about alcohol a lot of the time.	0	1	2	3	4	5	6	7	8
12.	I wanted to drink as soon as I had the chance.	0	1	2	3	4	5	6	7	8
13.	The bad things that could happen if I drank alcohol were fresh in my mind.	0	1	2	3	4	5	6	7	8
14.	If I had been at a party I would have had a drink without thinking twice.	0	1	2	3	4	5	6	7	8

McEvoy, P. M., Stritzke, W. G. K., French, D. J., Lang, A. R., & Ketterman, R. L. (2004). Comparison of three models of alcohol craving in young adults: a cross-validation. *Addiction, 99,* 482-497.

Appendix D.c

Comprehensive Effects of Alcohol: Expected Effects

This questionnaire assesses what you would expect to happen if you were under the influence of alcohol. Mark a response from (1) for disagree to (4) for agree, depending on whether or not you would expect the effect to happen to you if you were under the influence of alcohol. These effects will vary, depending upon the amount of alcohol you typically consume.

This is not a personality assessment. We want to know what you would expect to happen if you were to drink alcohol, not how you are when you are sober. Example: If you are always emotional, you would not mark agree as your answer for the statement "I would be emotional" unless you expected to become MORE EMOTIONAL if you drank.

If I were under the influence of alcohol:	Disagree	Slightly Disagree	Slightly Agree	Agree
1. I would be outgoing	①	②	③	④
2. My senses would be dulled	①	②	③	④
3. I would be humorous	①	②	③	④
4. My problems would seem worse	①	②	③	④
5. It would be easier to express my feelings	①	②	③	④
6. My writing would be impaired	①	②	③	④
7. I would feel sexy	①	②	③	④
8. I would have difficulty thinking	①	②	③	④
9. I would neglect my obligations	①	②	③	④
10. I would be dominant	①	②	③	④
11. My head would feel fuzzy	①	②	③	④
12. I would enjoy sex more	①	②	③	④
13. I would feel dizzy	①	②	③	④
14. I would be friendly	①	②	③	④
15. I would be clumsy	①	②	③	④
16. It would be easier to act out my fantasies	①	②	③	④
17. I would be loud, boisterous, or noisy	①	②	③	④
18. I would feel peaceful	①	②	③	④
19. I would be brave and daring	①	②	③	④
20. I would feel unafraid	①	②	③	④
21. I would feel creative	①	②	③	④
22. I would be courageous	①	②	③	④
23. I would feel shaky or jittery the next day	①	②	③	④
24. I would feel energetic	①	②	③	④
25. I would act aggressively	①	②	③	④
26. My responses would be slow	①	②	③	④
27. My body would be relaxed	①	②	③	④
28. I would feel guilty	①	②	③	④
29. I would feel calm	①	②	③	④
30. I would feel moody	①	②	③	④
31. It would be easier to talk to people	①	②	③	④
32. I would be a better lover	①	②	③	④
33. I would feel self-critical	①	②	③	④
34. I would be talkative	①	②	③	④
35. I would act tough	①	②	③	④
36. I would take risks	①	②	③	④
37. I would feel powerful	①	②	③	④
38. I would act sociable	①	②	③	④

Comprehensive Effects of Alcohol: Evaluations

This questionnaire assesses whether you think each effect, which may result from drinking alcohol, is bad or good.

Mark a response number from 1, for bad, to 5, for good – depending on whether you think this particular effect is bad, neutral, or good, etc.

We want to know if you think a particular effect is bad or good, REGARDLESS of whether you expect it to happen to YOU personally when you drink alcohol.

This effect of alcohol is:	Bad	Slightly Bad	Neutral	Slightly Good	Good
1. Being outgoing	①	②	③	④	⑤
2. Dulled senses	①	②	③	④	⑤
3. Being humorous	①	②	③	④	⑤
4. Problems seeming worse	①	②	③	④	⑤
5. Expressing feelings more easily	①	②	③	④	⑤
6. Impaired writing	①	②	③	④	⑤

Comprehensive Effects of Alcohol: Evaluations Continued

This effect of alcohol is:	Bad	Slightly Bad	Neutral	Slightly Good	Good
7. Feeling sexy	①	②	③	④	⑤
8. Having difficulty thinking	①	②	③	④	⑤
9. Neglecting obligations	①	②	③	④	⑤
10. Being dominant	①	②	③	④	⑤
11. Head feeling fuzzy	①	②	③	④	⑤
12. Enjoying sex more	①	②	③	④	⑤
13. Feeling dizzy	①	②	③	④	⑤
14. Being friendly	①	②	③	④	⑤
15. Being clumsy	①	②	③	④	⑤
16. Easier to act out fantasies	①	②	③	④	⑤
17. Being loud, boisterous, or noisy	①	②	③	④	⑤
18. Feeling peaceful	①	②	③	④	⑤
19. Being brave and daring	①	②	③	④	⑤
20. Feeling unafraid	①	②	③	④	⑤
21. Feeling creative	①	②	③	④	⑤
22. Being courageous	①	②	③	④	⑤
23. Feeling shaky or jittery the next day	①	②	③	④	⑤
24. Feeling energetic	①	②	③	④	⑤
25. Acting aggressively	①	②	③	④	⑤
26. Having slow responses	①	②	③	④	⑤
27. Having a relaxed body	①	②	③	④	⑤
28. Feeling guilty	①	②	③	④	⑤
29. Feeling calm	①	②	③	④	⑤
30. Feeling moody	①	②	③	④	⑤
31. Being easier to talk to people	①	②	③	④	⑤
32. Being a better lover	①	②	③	④	⑤
33. Feeling self-critical	①	②	③	④	⑤
34. Being talkative	①	②	③	④	⑤
35. Acting tough	①	②	③	④	⑤
36. Taking risks	①	②	③	④	⑤
37. Feeling powerful	①	②	③	④	⑤
38. Acting sociable	①	②	③	④	⑤

Appendix D.d

Instructions for Filling Out the Timeline Alcohol Use Calendar

To help us evaluate your drinking, we need to get an idea of what your alcohol use was like in the past ____ days. To do this, we would like you to fill out the attached calendar.

- ✓ Filling out the calendar is not hard!
- ✓ Try to be as accurate as possible.
- ✓ We recognize you won't have perfect recall. That's OKAY.

✓ WHAT TO FILL IN

- The idea is to put a number in for each day on the calendar.
- On days when you did not drink, you should write a "0".
- On days when you did drink, you should write in the total number of drinks you had.
- We want you to record your drinking on the calendar using Standard Drinks. *For example*, if you had 6 beers, write the number 6 for that day. If you drank two or more different kinds of alcoholic beverages in a day such as 2 beers and 3 glasses of wine, you would write the number 5 for that day.

It's important that something is written for <u>every</u> day, even if it is a "0".

✓ YOUR BEST ESTIMATE

- We realize it isn't easy to recall things with 100% accuracy.
- If you are not sure whether you drank 7 or 11 drinks or whether you drank on a Thursday or a Friday, give it your best guess! What is important is that 7 or 11 drinks is very different from 1 or 2 drinks or 25 drinks. The goal is to get a sense of how frequently you drank, how much you drank, and your patterns of drinking.

✓ HELPFUL HINTS

- If you have an appointment book you can use it to help you recall your drinking.
- Holidays such as Thanksgiving and Christmas are marked on the calendar to help you better recall your drinking. Also, think about how much you drank on personal holidays & events such as birthdays, vacations, or parties.
- If you have regular drinking patterns you can use these to help you recall your drinking. For example, you may have a daily or weekend/weekday pattern, or drink more in the summer or on trips, or you may drink on Wednesdays after playing sports.

✓ COMPLETING THE CALENDAR

- A blank calendar is attached. Write in the number of Standard Drinks that you had each day.
- The time period we are talking about on the calendar is from _____ to _____.
- In estimating your drinking, be as accurate as possible.
- DOUBLE CHECK THAT <u>ALL</u> DAYS ARE FILLED IN BEFORE RETURNING THE CALENDAR.
- Before you start look at the SAMPLE CALENDAR AND STANDARD DRINK CHART on the next page.

Instructions for Filling Out the Timeline Alcohol Use Calendar

✓ **SAMPLE CALENDAR**

2000	SUN	MON	TUES	WED	THURS	FRI	SAT
						1 8	2 0
S	3 7	4 Labor Day 0	5 3	6 8	7 1	8 0	9 11
E	10 2	11 2	12 0	13 3	14 5	15 14	16 4
P	17 2	18 0	19 0	20 0	21 0	22 2	23 13
T	24 0	25 0	26 6	27 0	28 0	29 0	30 2

U. S. STANDARD DRINK CONVERSION CHART

One Standard Drink Is Equal To

- 12 oz of BEER (5%)
- 5 oz of WINE (10% – 12%)
- 3 oz of FORTIFIED WINE (16% – 18%)
- 1.5 oz of HARD LIQUOR (86 proof – 100 proof; 43% – 50%)

- WINE: 1 Bottle

25 oz/750 ml	=	5 standard drinks
40 oz/1.5 liter	=	8 standard drinks
25 oz fortified	=	8 1/3 standard drinks

- HARD LIQUOR: 1 Bottle

12 oz (mickey)	=	8 standard drinks
26 oz	=	17 1/3 standard drinks
40 oz	=	26 2/3 standard drinks

Name/ID#: ___ Date: _

TIMELINE FOLLOWBACK CALENDAR: 2014

1 Standard Drink is Equal to

One 12 oz can/bottle of beer

One 5 oz glass of regular (12%) wine

1 ½ oz of hard liquor (e.g. rum, vodka, whiskey)

1 mixed or straight drink with 1 ½ oz hard liquor

Complete the Following

Start Date (Day 1): _____ **End Date** (yesterday):_____

MO DY YR MO DY YR

2014	SUN	MON	TUES	WED	THURS	FRI	SAT
				1 New Year's Day	2	3	4
J	5	6	7	8	9	10	11
A	12	13	14	15	16	17	18
N	19	20 M. King Day	21	22	23	24	25
	26	27	28	29	30	31 Chinese New Yr	1
F	2	3	4	5	6	7	8
E	9	10	11	12	13	14 Valentines Dy	15
B	16	17 Pres. Day	18	19	20	21	22
	23	24	25	26	27	28	1
M	2	3	4	5	6	7	8
A	9	10	11	12	13	14	15
R	16	17 St. Patrick	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31	1	2	3	4	5
A	6	7	8	9	10	11	12
P	13	14 Passover	15	16	17	18 Good Friday	19
R	20 Easter	21	22	23	24	25	26
	27	28	29	30	1	2	3
M	4	5	6	7	8	9	10
A	11 Mother's Day	12	13	14	15	16	17
Y	18	19	20	21	22	23	24
	25	26 Memorial Day	27	28	29	30	31

2014	SUN	MON	TUES	WED	THURS	FRI	SAT
JUN	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15 Father's Day	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	1	2	3	4 Independence Dy	5
JUL	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	1	2
AUG	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
SEP	31	1 Labor Day	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25 Rosh Hashanah	26	27
	28	29	30	1	2	3 Yom Kippur	4
OCT	5	6	7	8	9	10	11
	12	13 Columbus Day	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31 Halloween	1
NOV	2	3	4 Election Day	5	6	7	8
	9	10	11 Veterans Day	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27 Thanksgiving	28	29
	30	1	2	3	4	5	6
DEC	7	8	9	10	11	12	13
	14	15	16 Hanukkah	17	18	19	20
	21	22	23	24	25 Christmas	26	27
	28	29	30	31 New Years Eve			

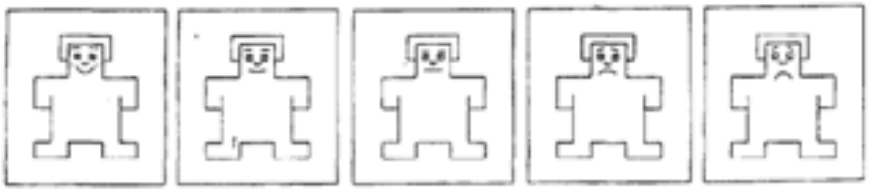
Appendix E.

B

PRACTICE Self-Assessment Manikin Rating Form

Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



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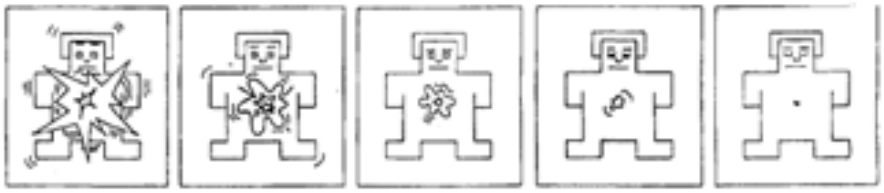
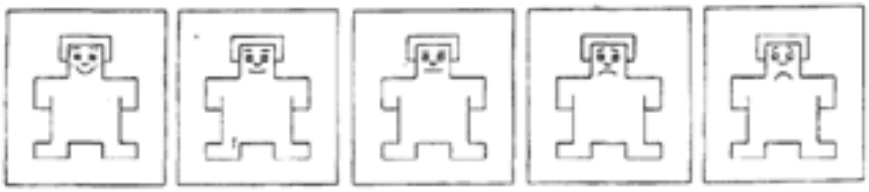
Excited Calm



1 2 3 4 5 6 7 8 9

Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



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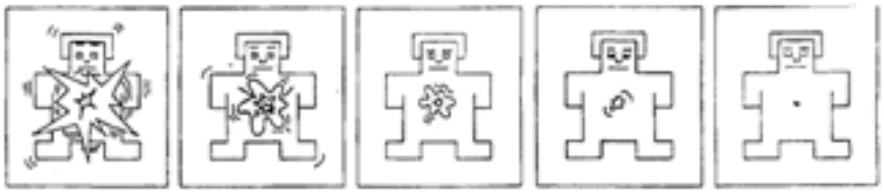
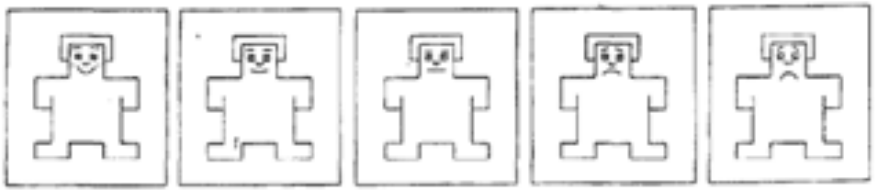


1 2 3 4 5 6 7 8 9

Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



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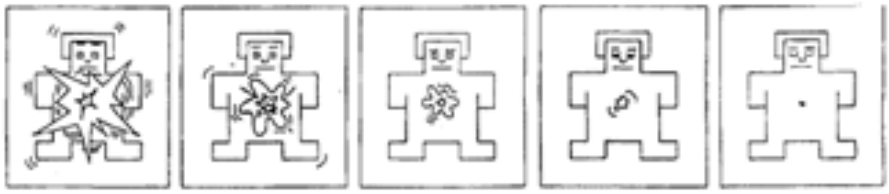


1 2 3 4 5 6 7 8 9

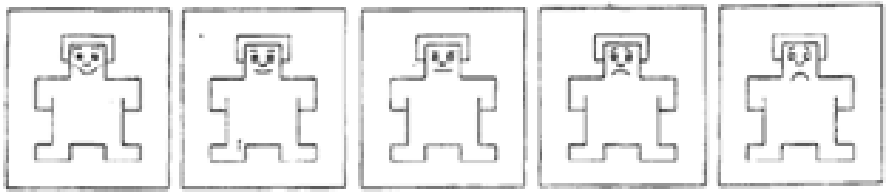
Appendix F.

C

Self-Assessment Manikin Rating Form

Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



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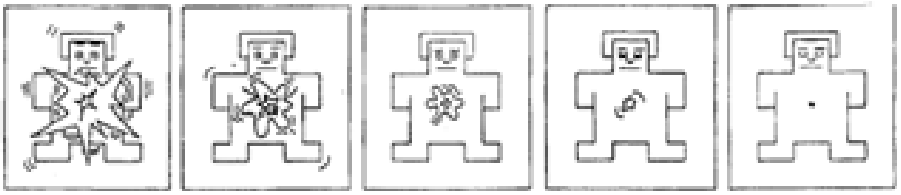
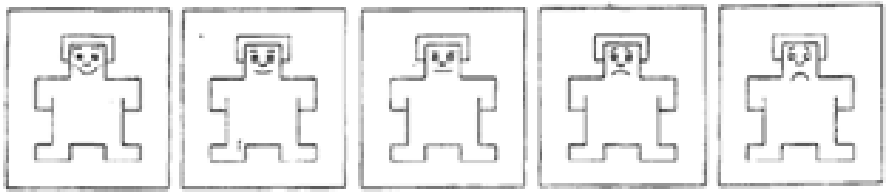


1 2 3 4 5 6 7 8 9

Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



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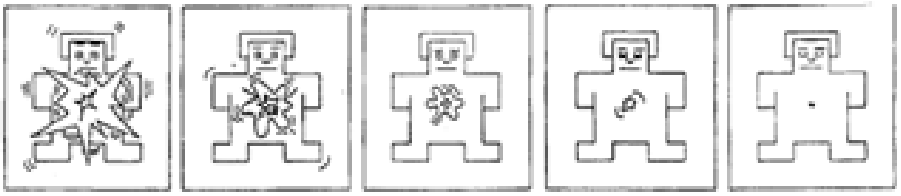
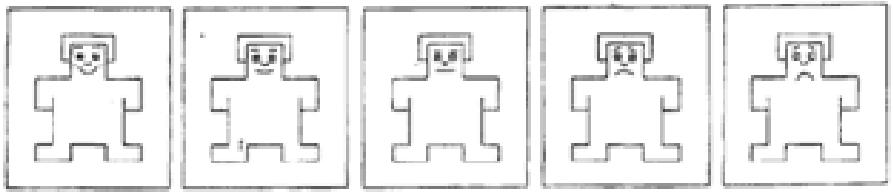
Excited Calm



1 2 3 4 5 6 7 8 9

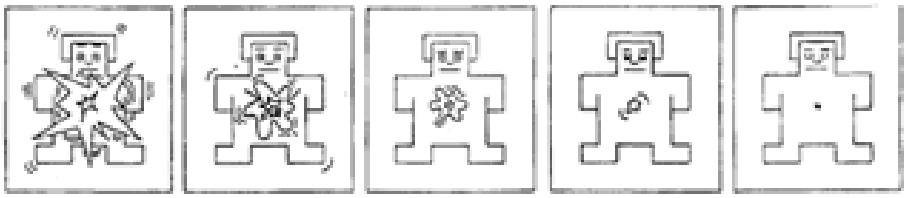
Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



1 2 3 4 5 6 7 8 9

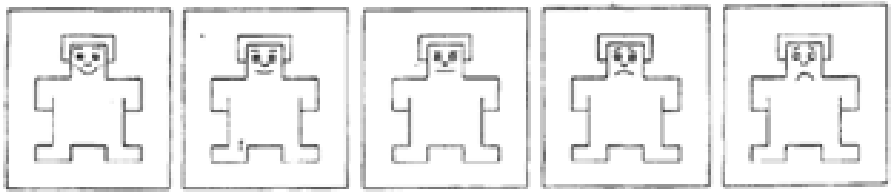
Excited Calm



1 2 3 4 5 6 7 8 9

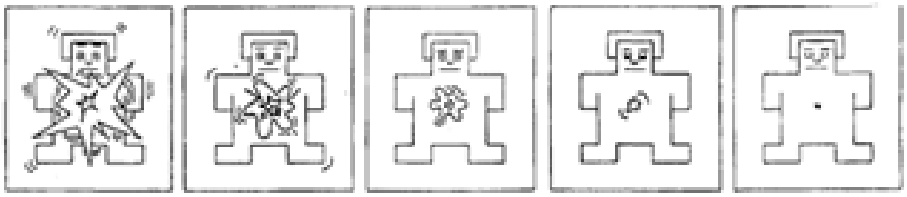
Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



1 2 3 4 5 6 7 8 9

Excited Calm



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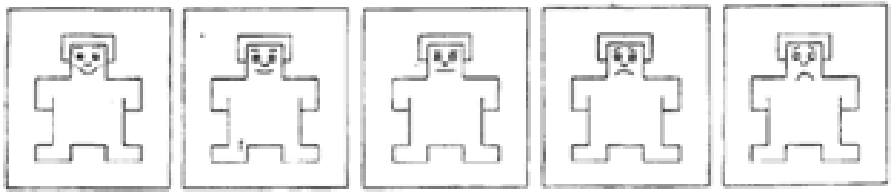

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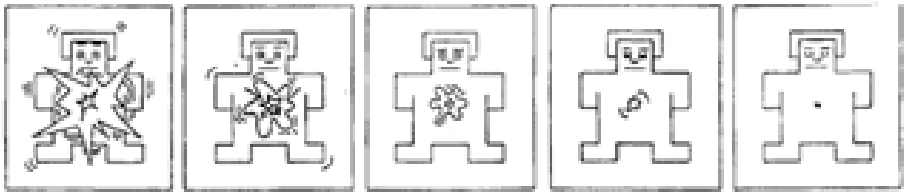

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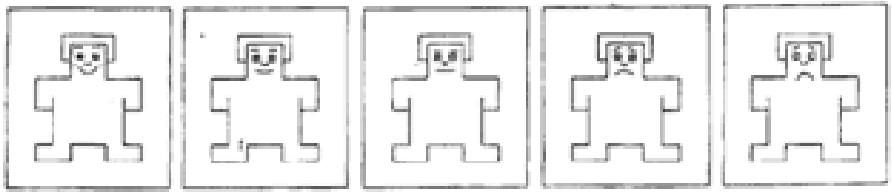

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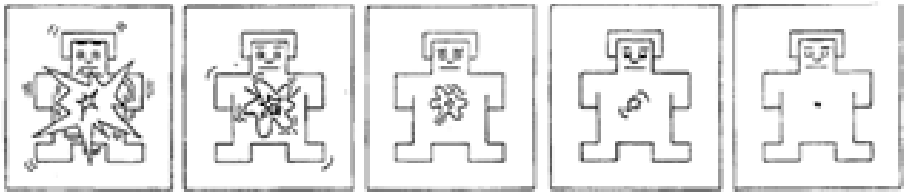

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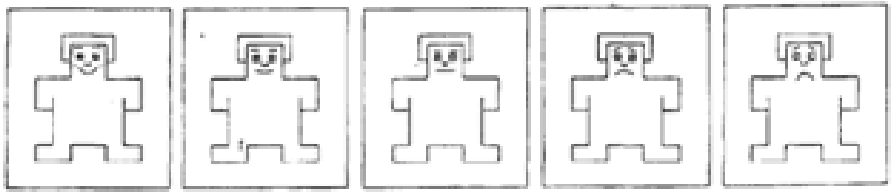

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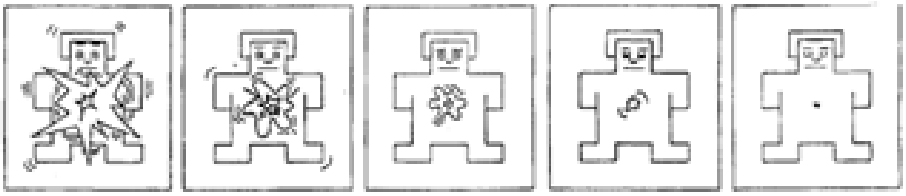

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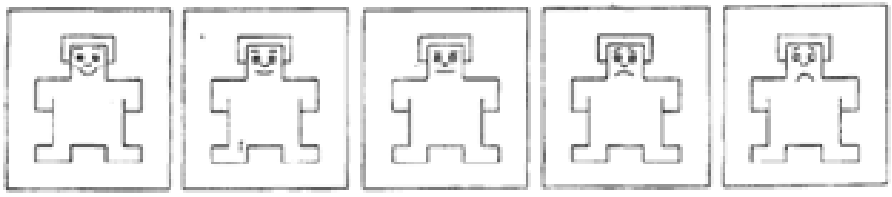

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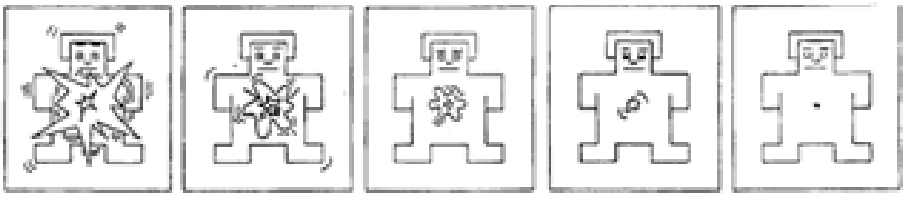

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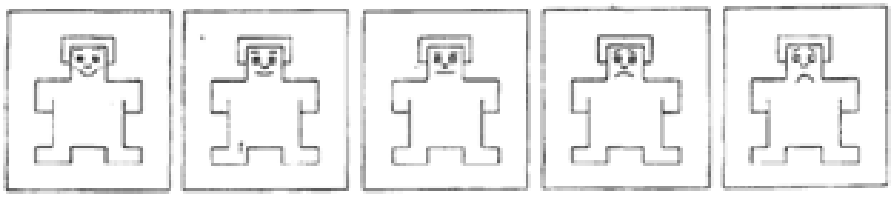

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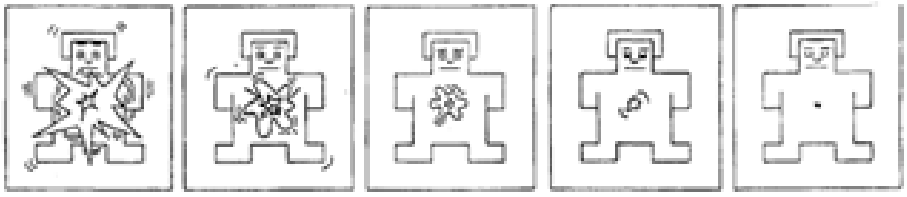

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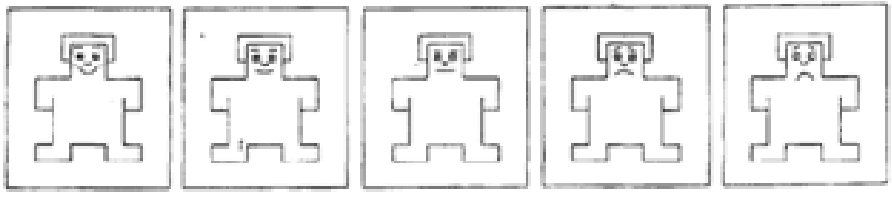

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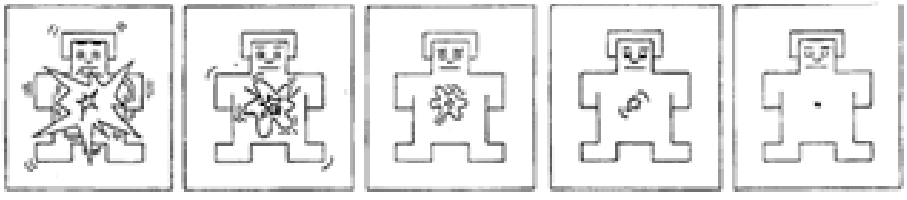

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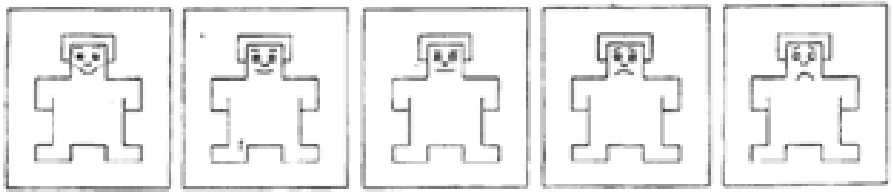

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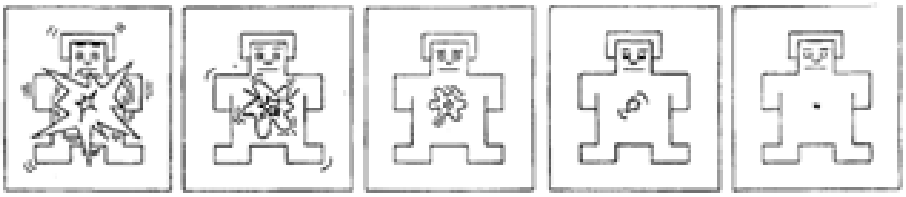

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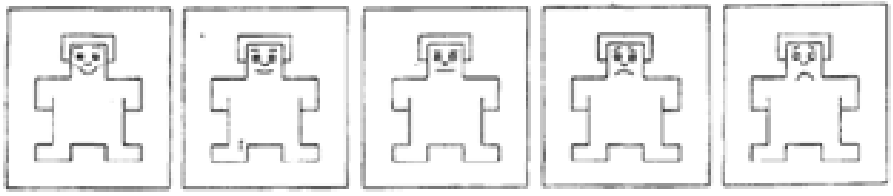

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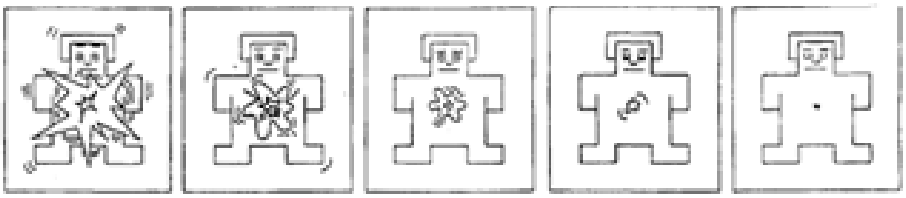

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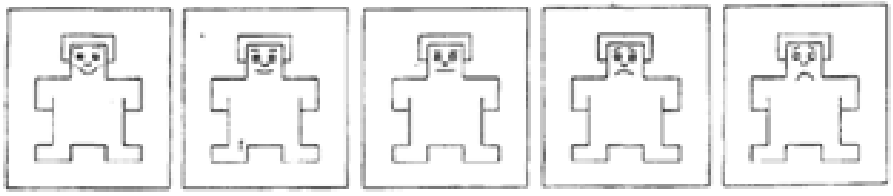

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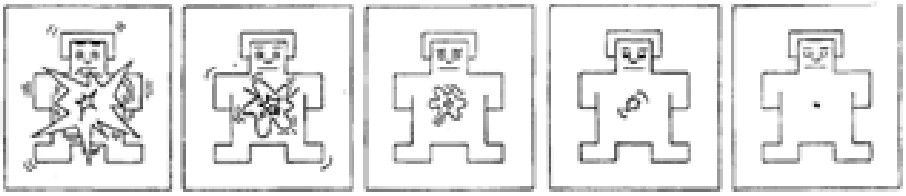

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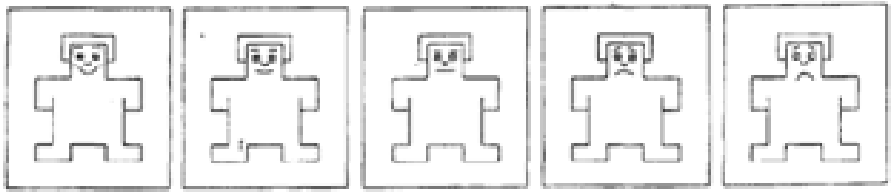

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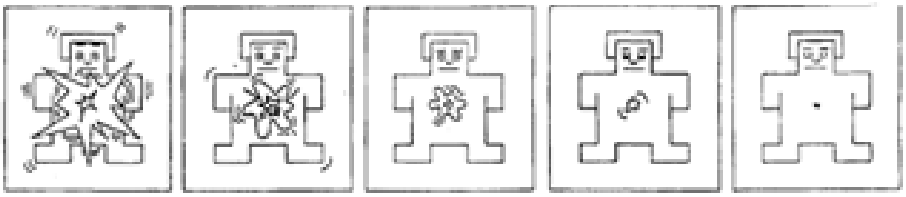

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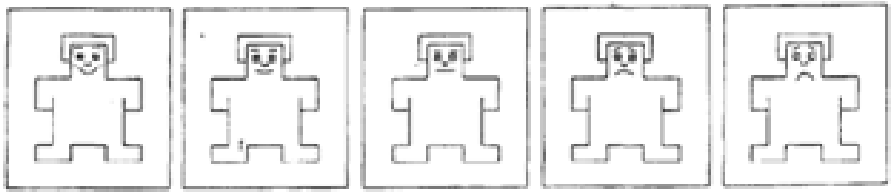

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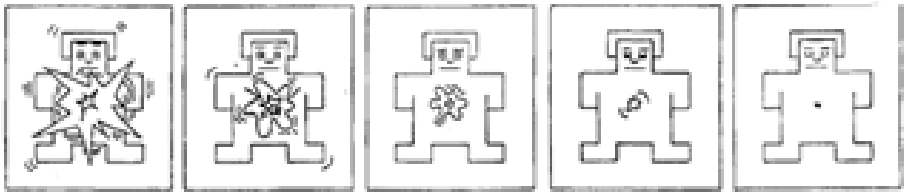

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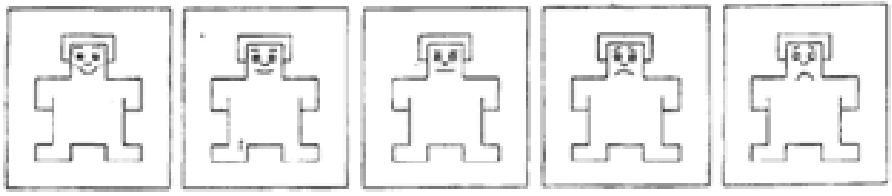

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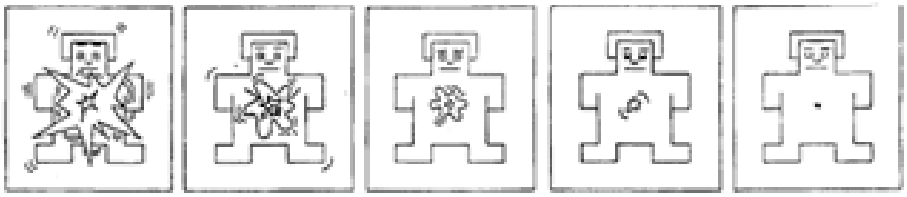

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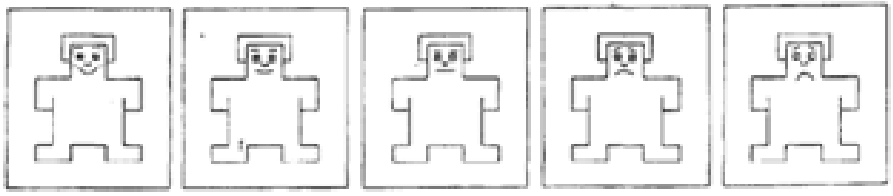

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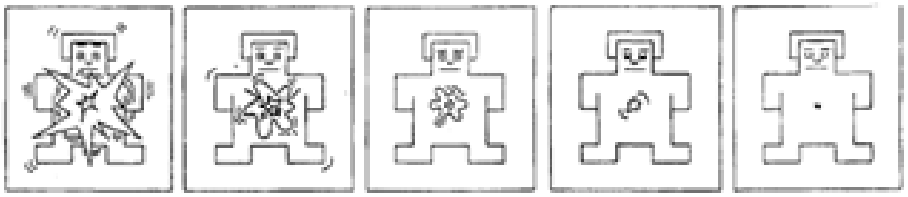

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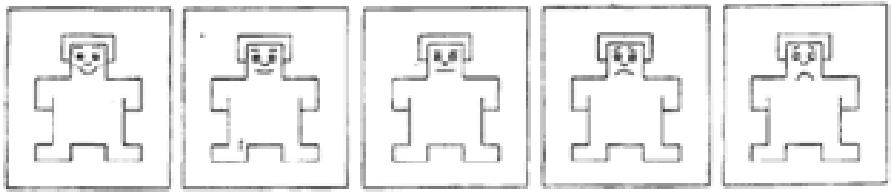

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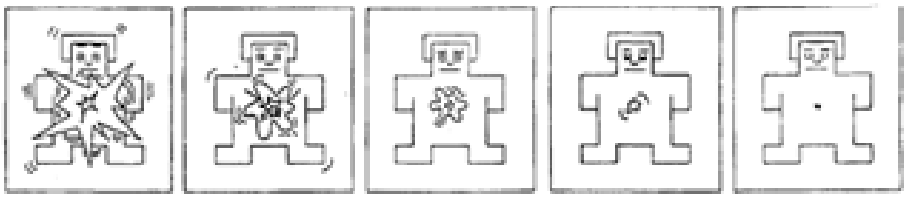

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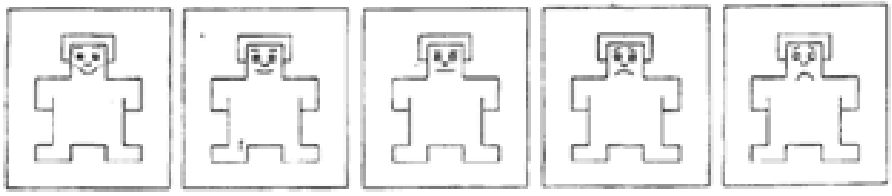

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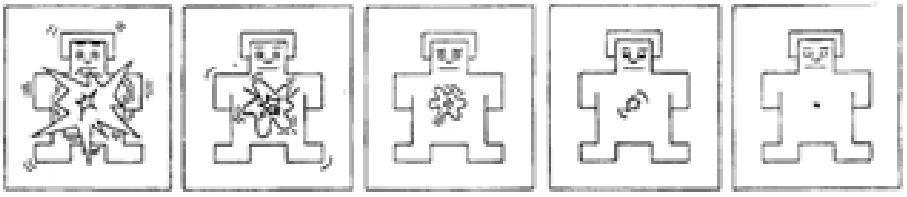

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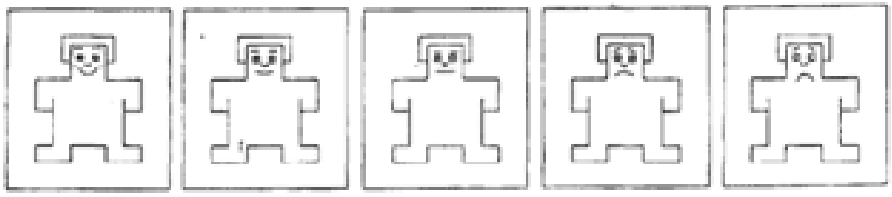

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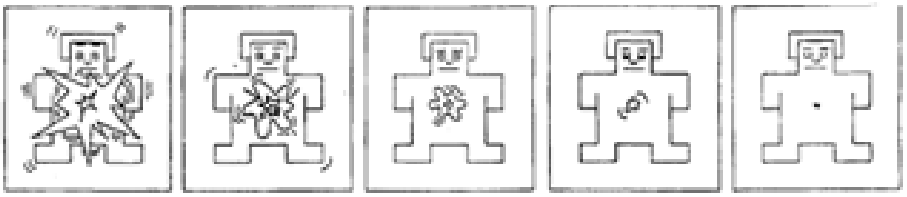

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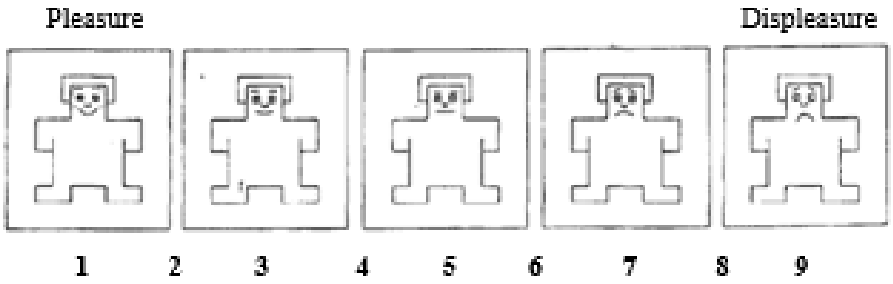

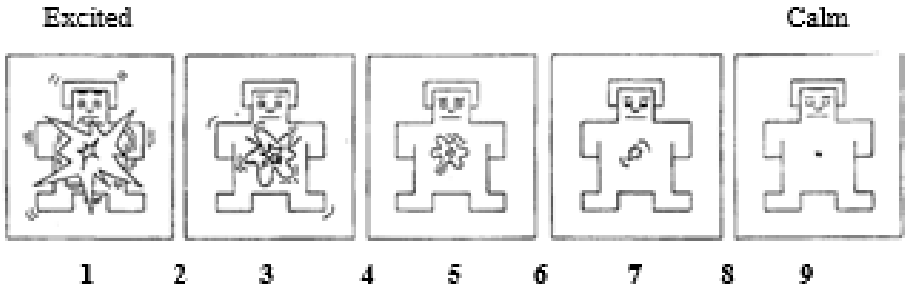

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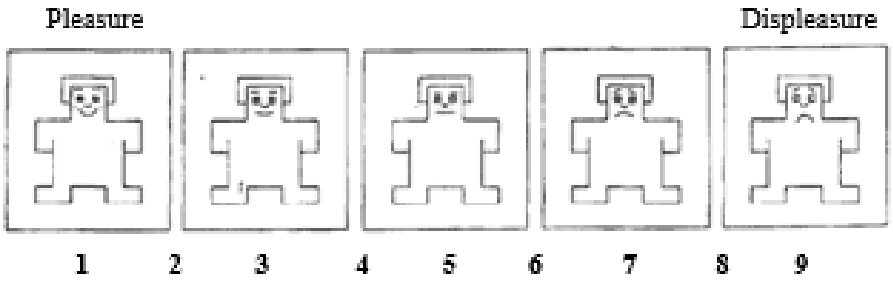

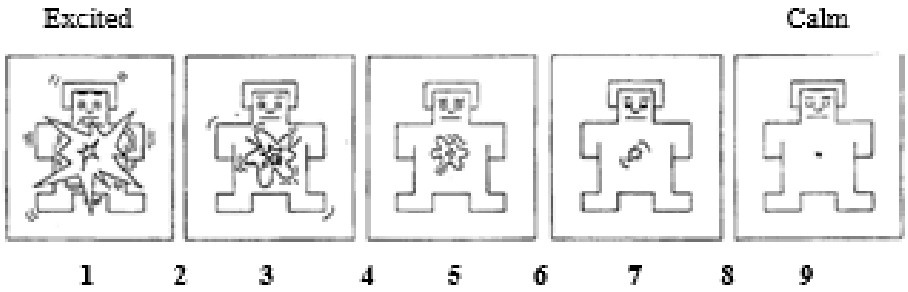

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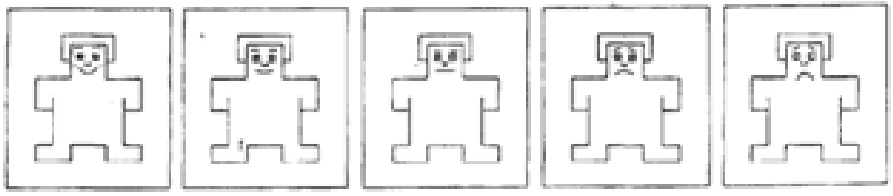

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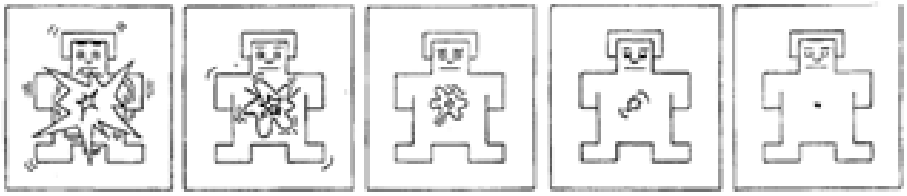

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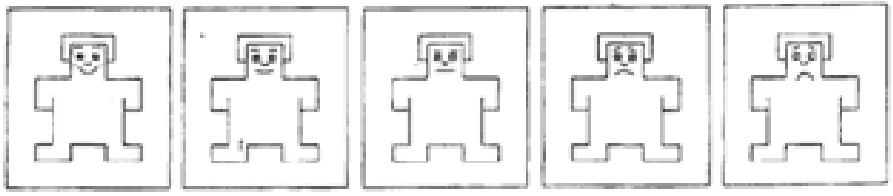

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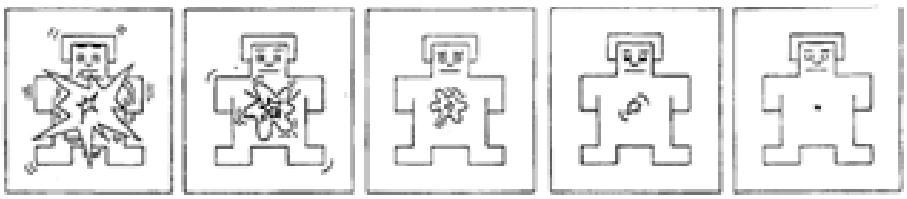

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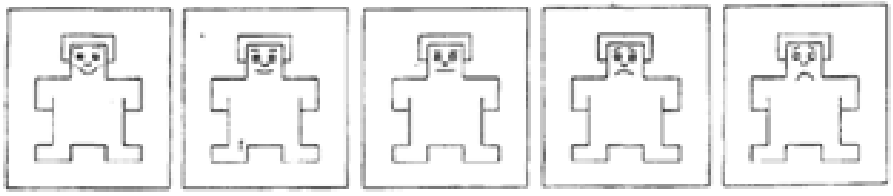

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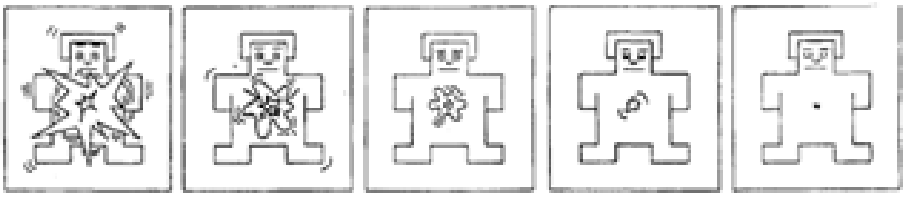

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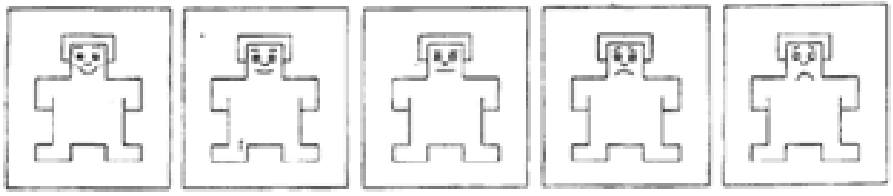

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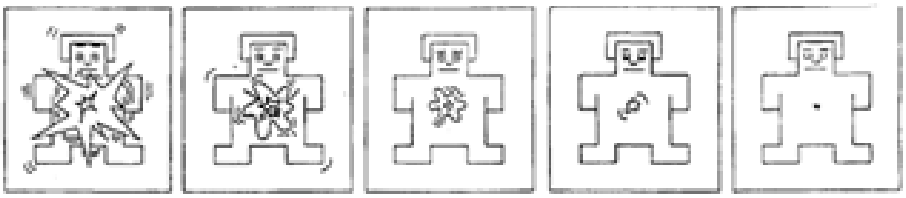

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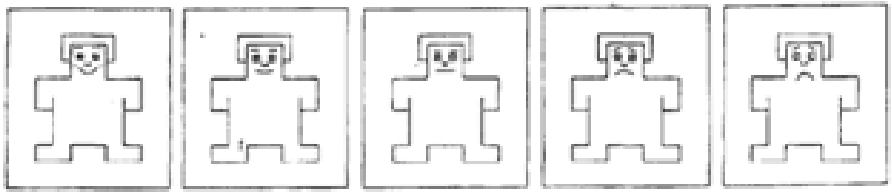

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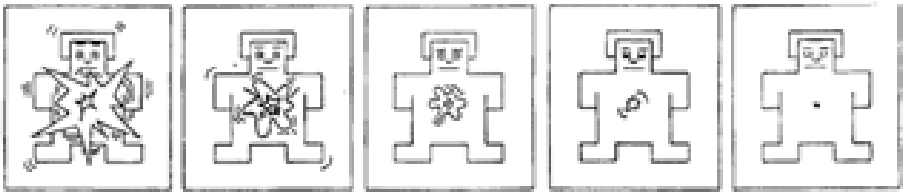

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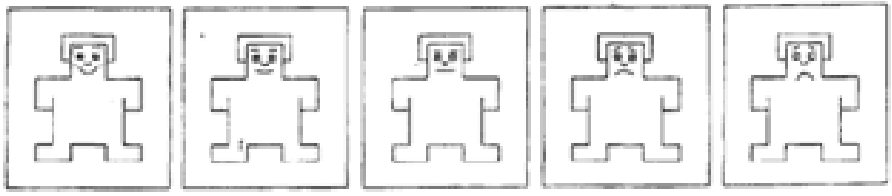

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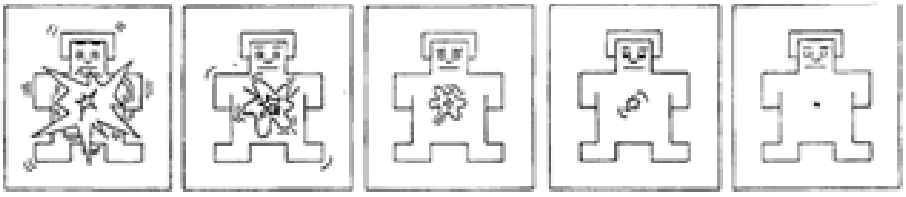

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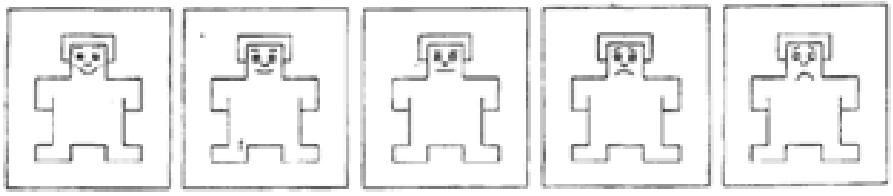

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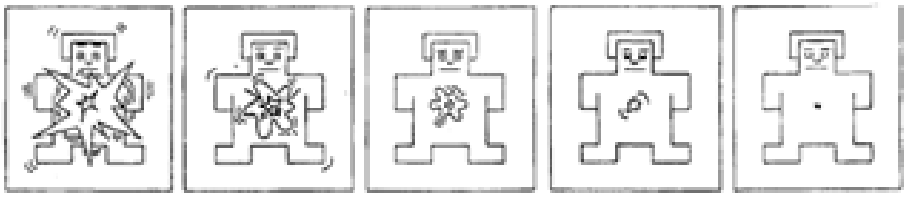

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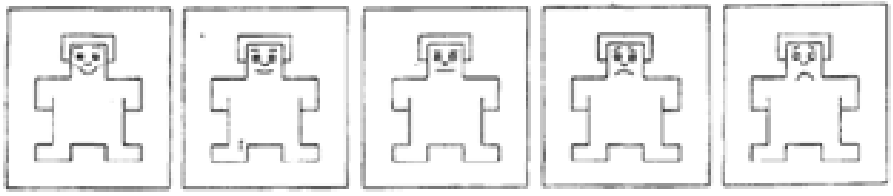

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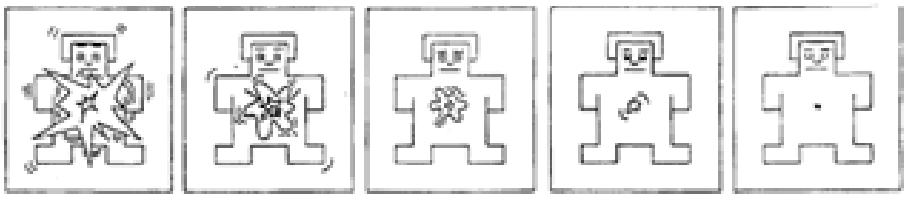

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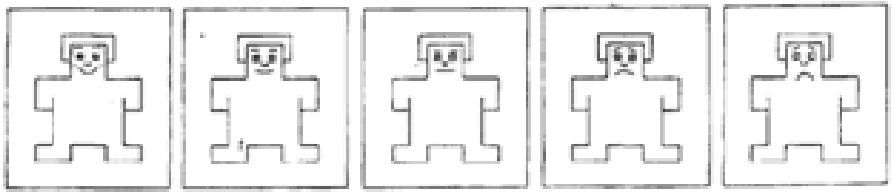

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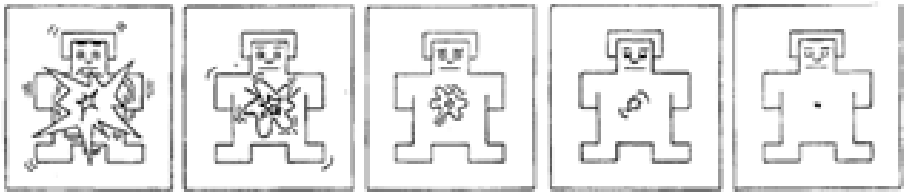

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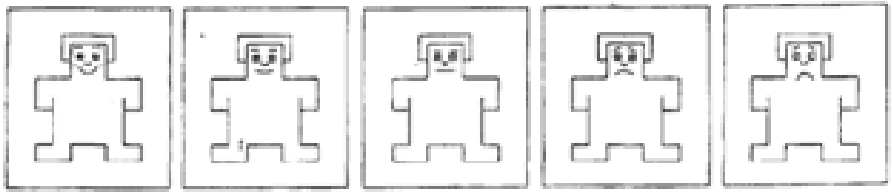

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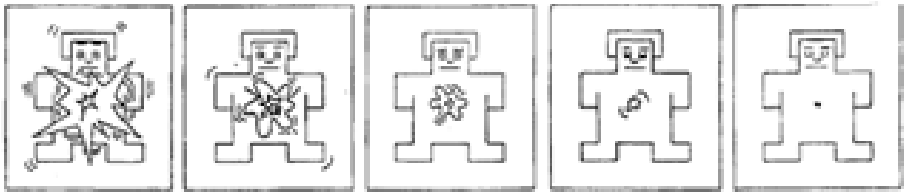

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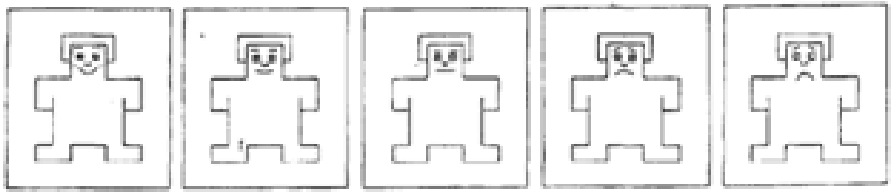

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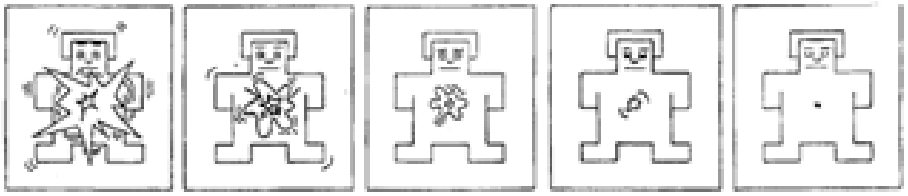

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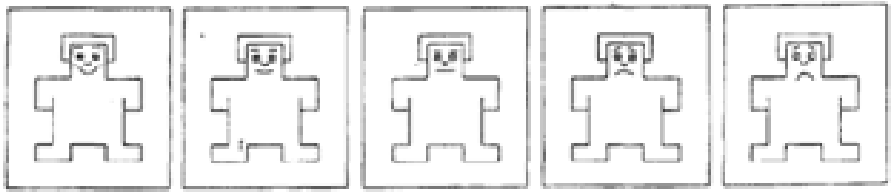

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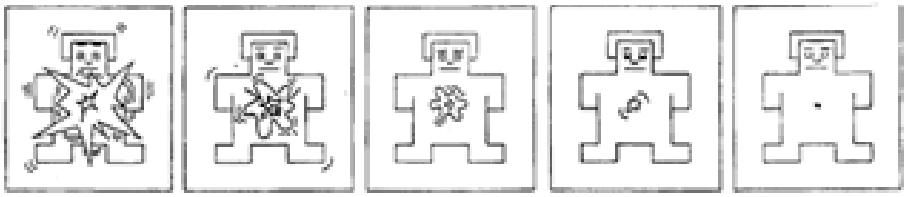

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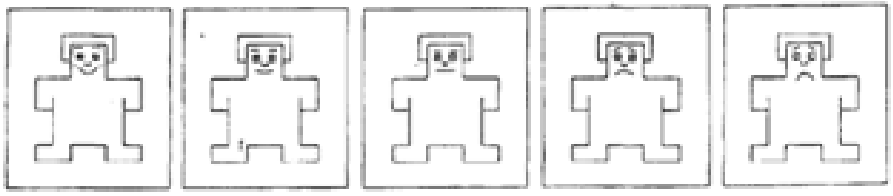

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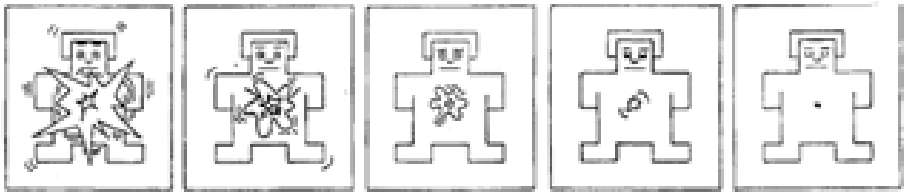

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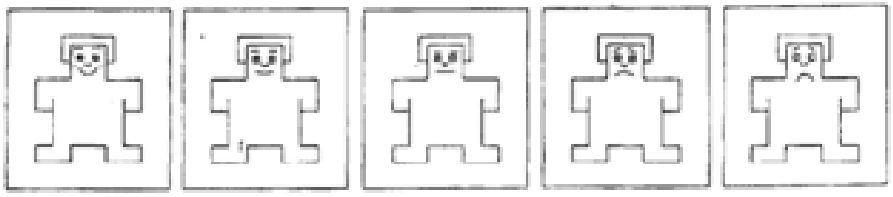

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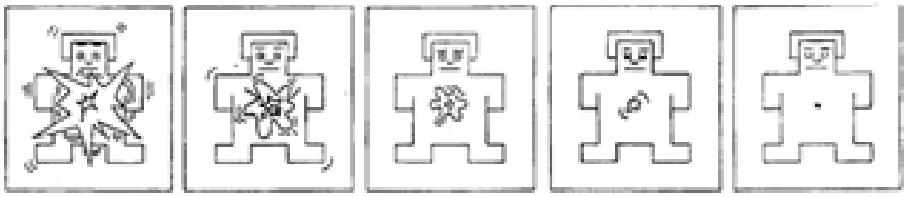

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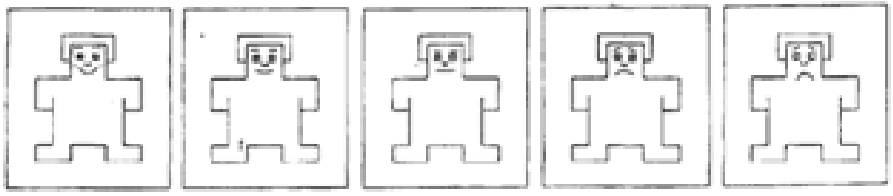

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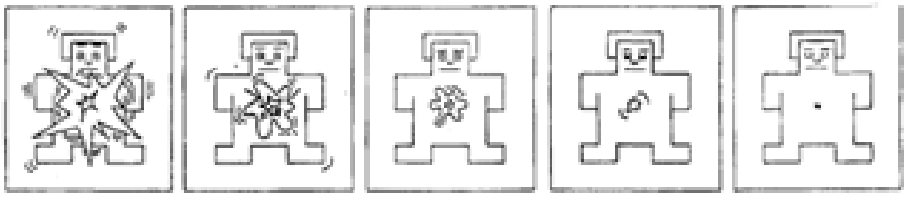

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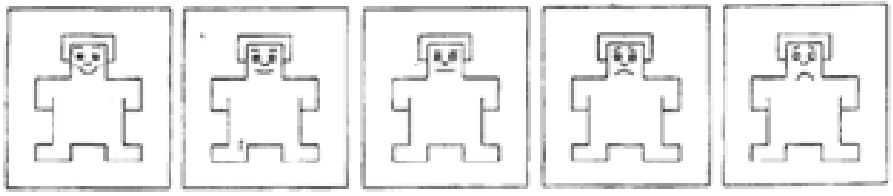

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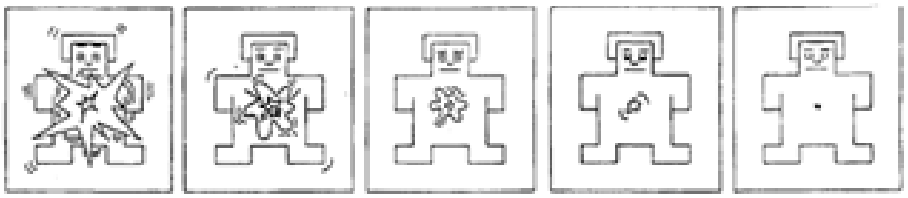

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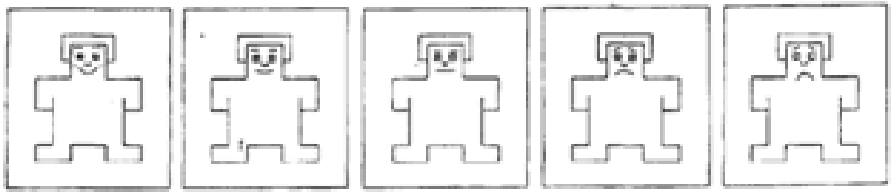

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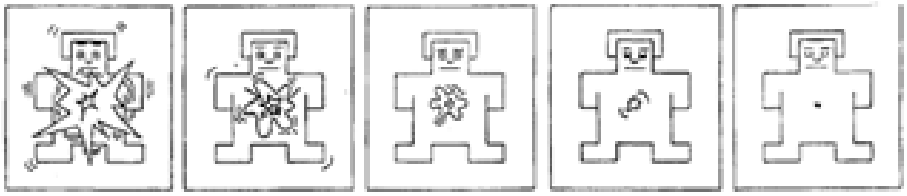

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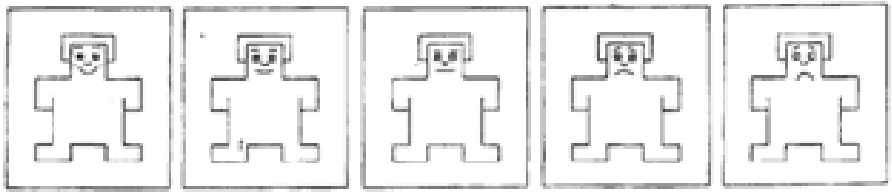

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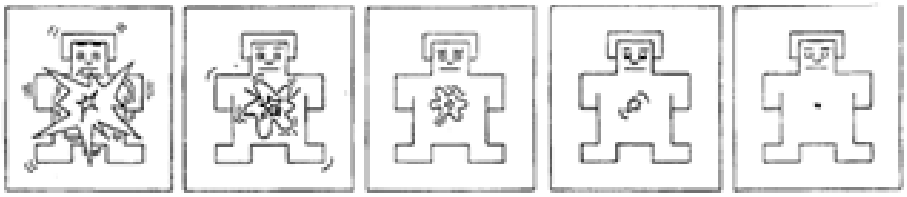

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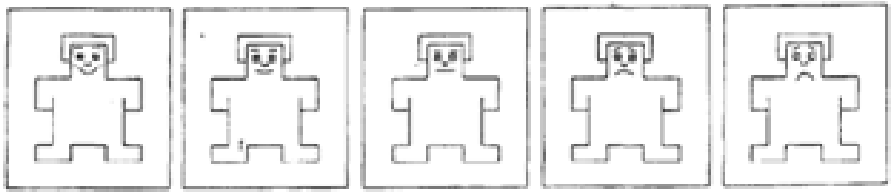

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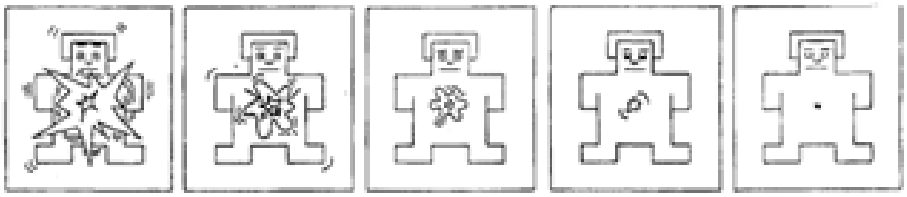

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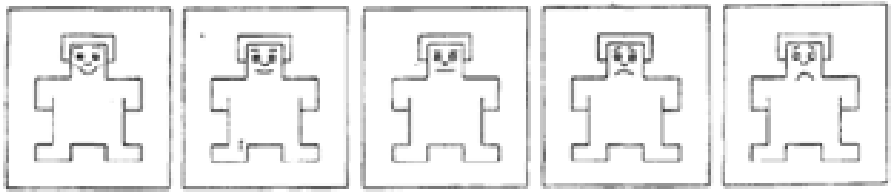

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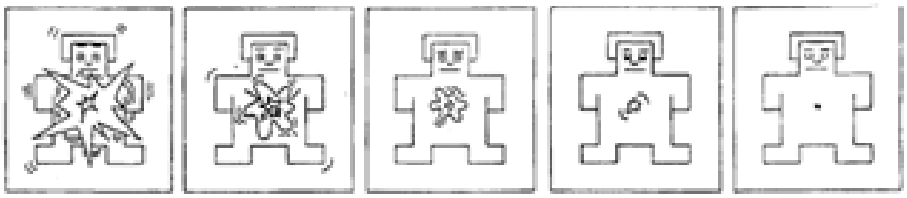

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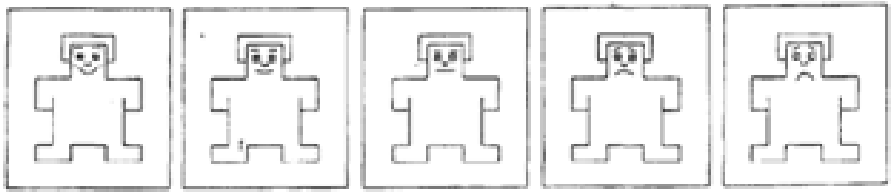

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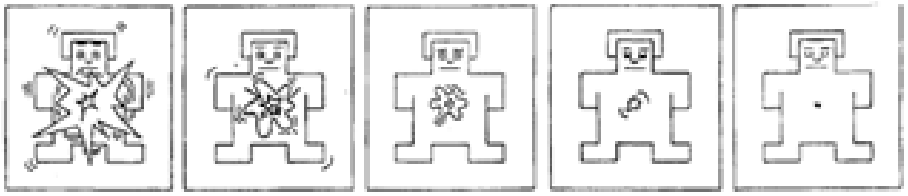

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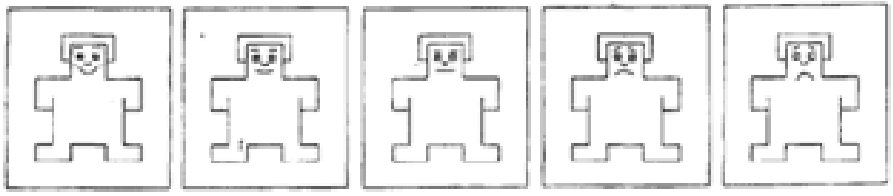

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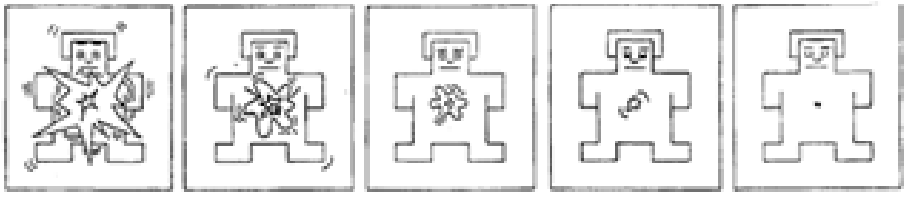

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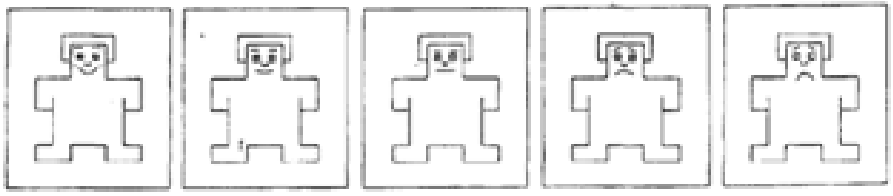

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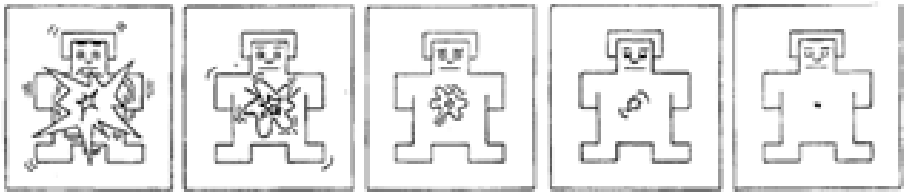

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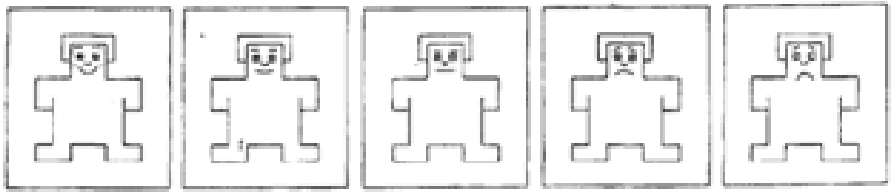

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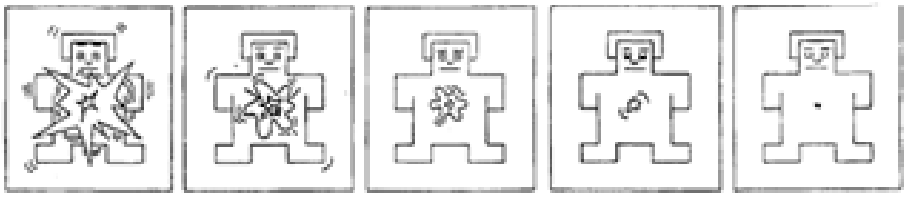

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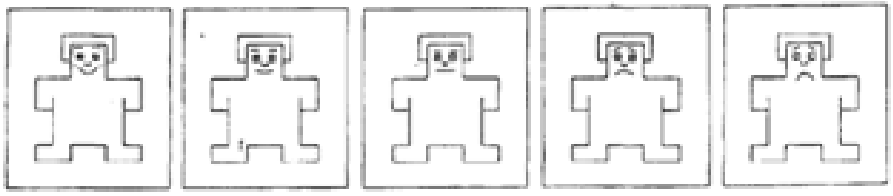

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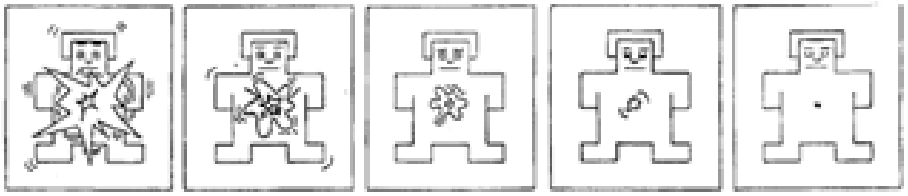

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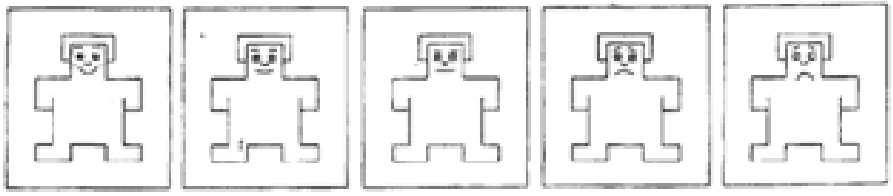

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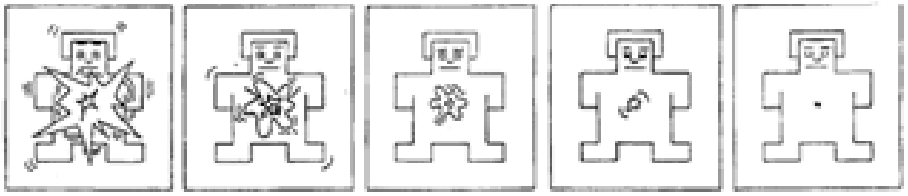

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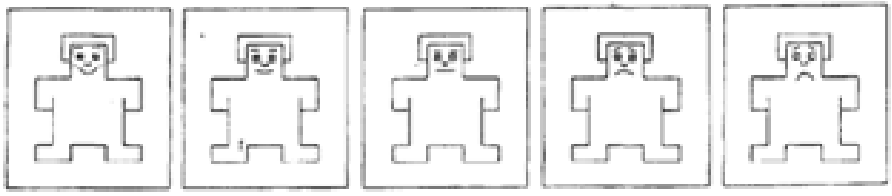

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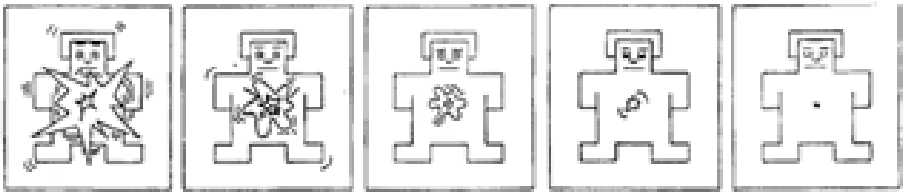

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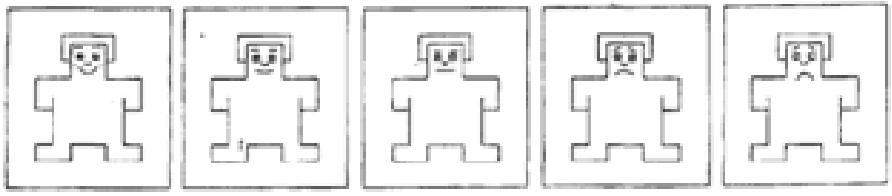

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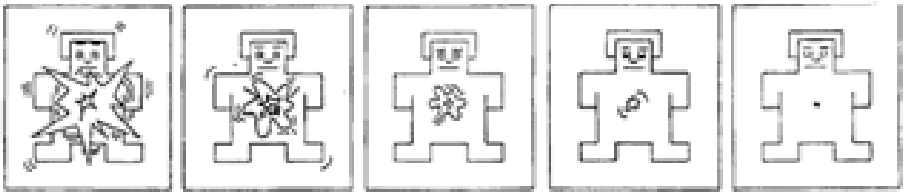

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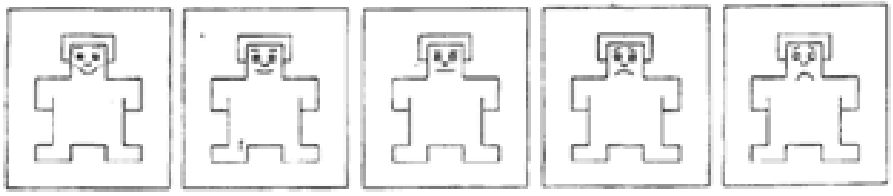

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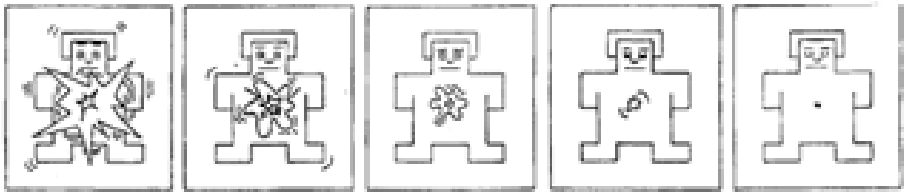

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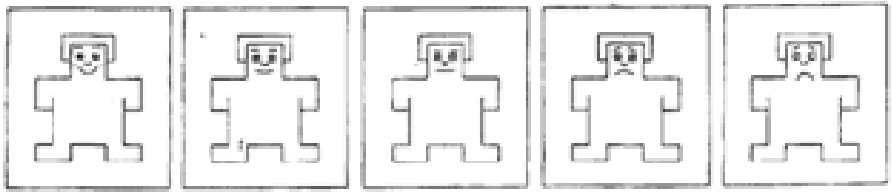

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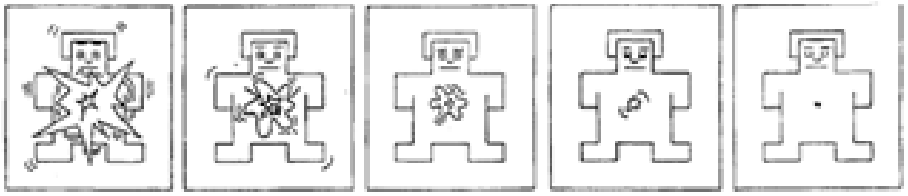

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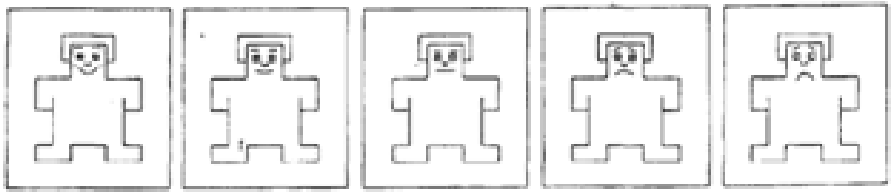

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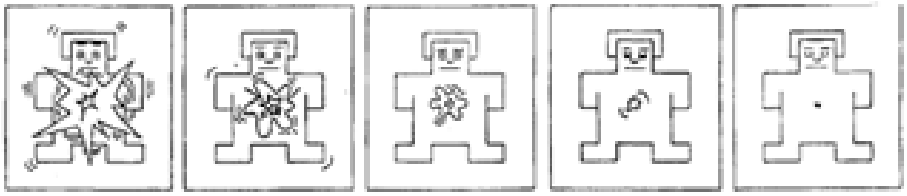

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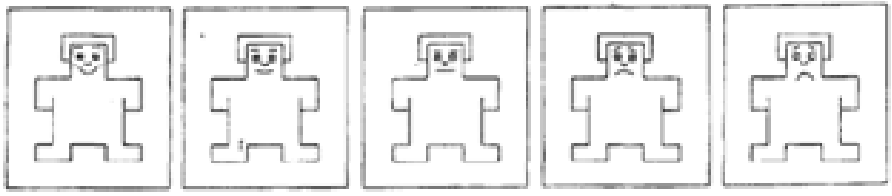

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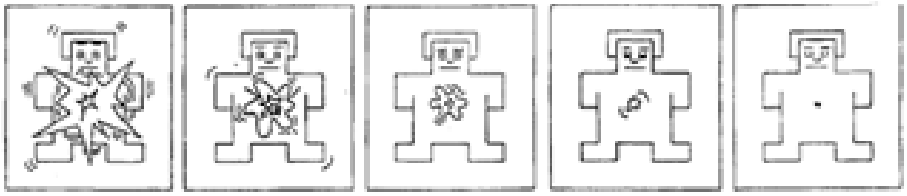

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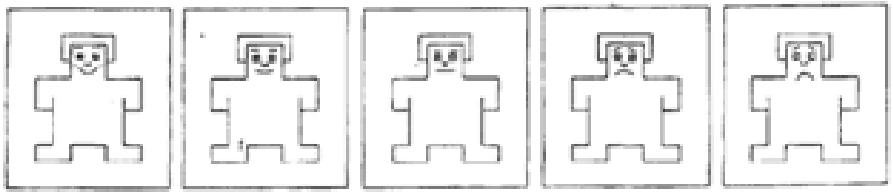

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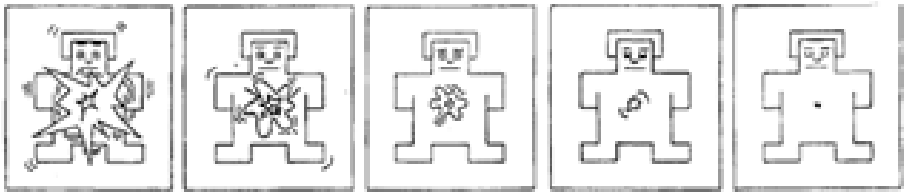

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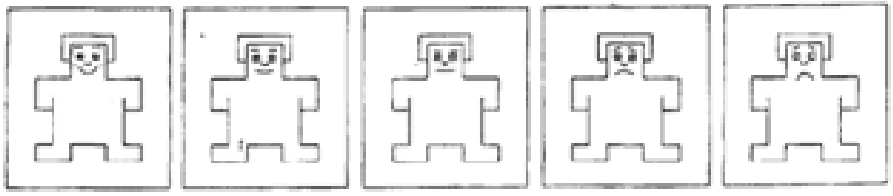

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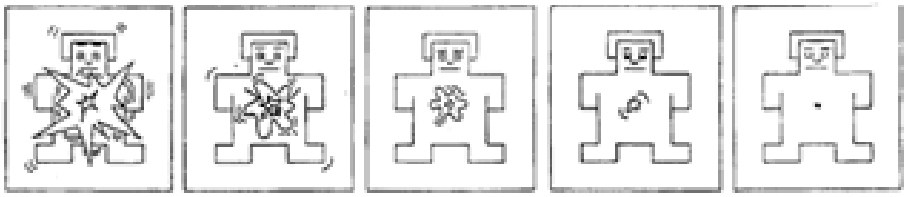
Excited Calm



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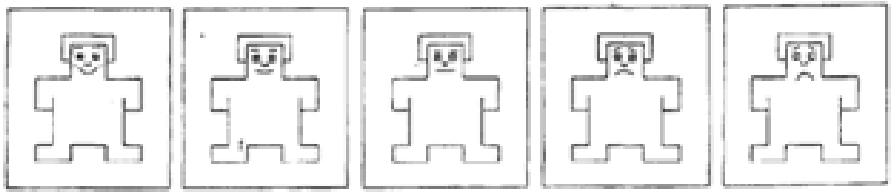
Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



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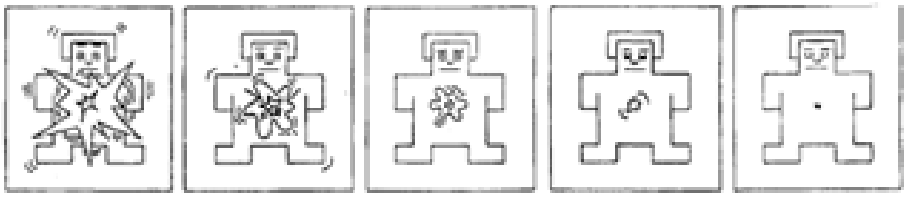
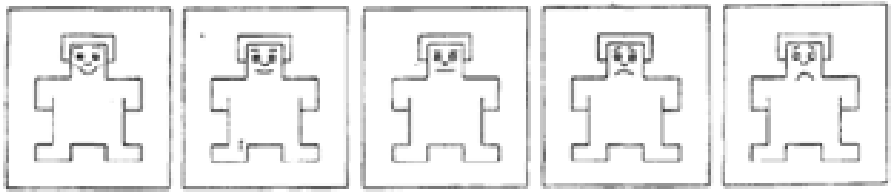


1 2 3 4 5 6 7 8 9

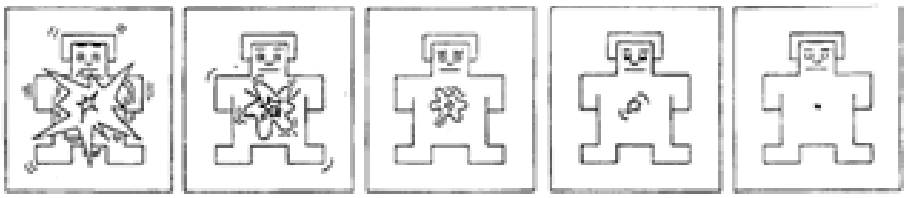
Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



1 2 3 4 5 6 7 8 9

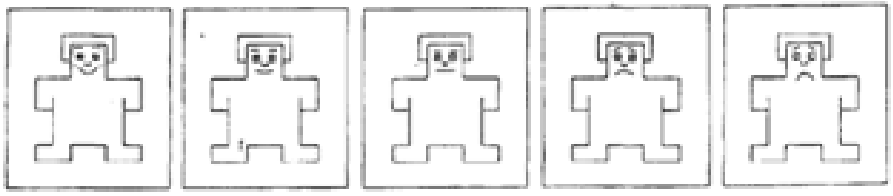
Excited Calm



1 2 3 4 5 6 7 8 9

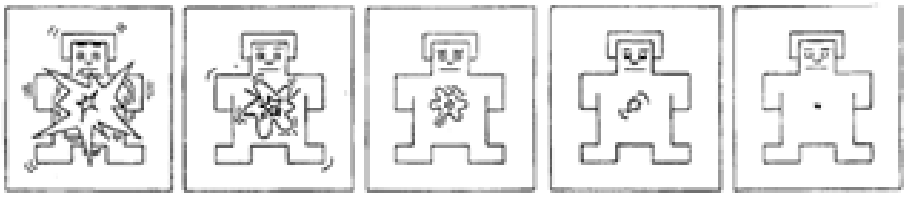
Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



1 2 3 4 5 6 7 8 9

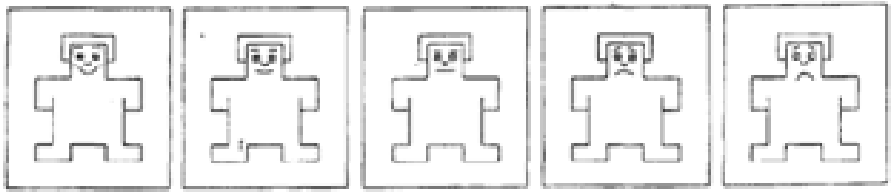
Excited Calm



1 2 3 4 5 6 7 8 9

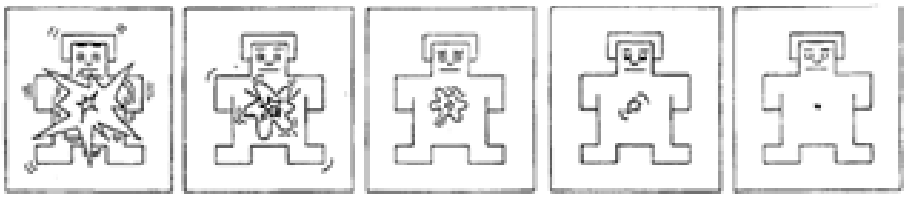
Please indicate how the picture makes you feel while viewing it:

Pleasure Displeasure



1 2 3 4 5 6 7 8 9

Excited Calm



1 2 3 4 5 6 7 8 9

Appendix G.

DEBRIEFING FORM

Title of study: Cue Reactivity to Images

Name of researchers: Kelsey Krueger, Cyrus Nikain, Brittany Rodriguez, Mallory Snyder, Nikita Ferrao, Jessica Corrente, James Ferrante IV

Email: kmkruege@syr.edu

Faculty Supervisor/Email: Dr. Randall S. Jorgensen rsjorgen@syr.edu

Purpose of the study: The researchers were interested in exploring how different individuals react to images of alcohol. In order to study this topic, the researcher must first develop a series of images to be used future in cue reactivity tasks. The questionnaires included were used to collect information regarding individual differences in alcohol use characteristics and behaviors.
Methods used: Participants completed two tasks. After signing the Informed Consent Form, participants were asked to complete a brief questionnaire packet regarding demographic items and alcohol consumption. Second, participants were asked to view a series of images on a projector screen and rate how the pictures make them feel
Future Directions: The researchers are interested in looking at individual differences that account for different reactivity to images of alcohol. For example, do people with certain personality traits react differently to images of alcohol? What about people with certain expectations of alcohol consumption? These are just a few examples of how the picture set developed from this study can test many intriguing hypotheses.

If you would like results of the study, please provide the following information:

Name: _____ Email: _____

Thank you very much for your participation. Feel free to contact the researchers or the faculty supervisor listed above if you have any questions.

Appendix H.

List of Referrals

- **Counseling Center**
  200 Walnut Place
  Syracuse, NY 13244
  (315) 443-4715

- **Health Services**
  111 Waverly Ave
  Syracuse, NY 13244
  (315) 443-9005

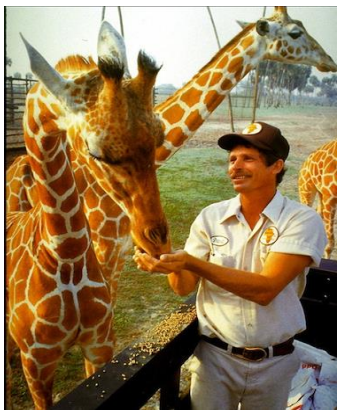
- **Hendricks Chapel**
  (315) 443-2902

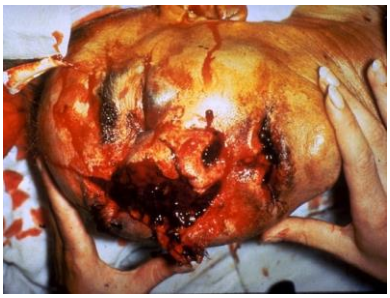
- **Office of Student Assistance**
  306 Steele Hall
  Syracuse, NY 13244
  (315) 443-4357 (HELP)

- **Options Program**
  111 Waverly Ave, Suite 006
  Syracuse, NY 13244
  (315) 443-4234

- **Psychological Services Center**
  804 University Avenue, Suite 201
  Syracuse, NY 13244
  (315) 443-3595

Appendix I.




























GIANT
QUALITY

Appendix J.

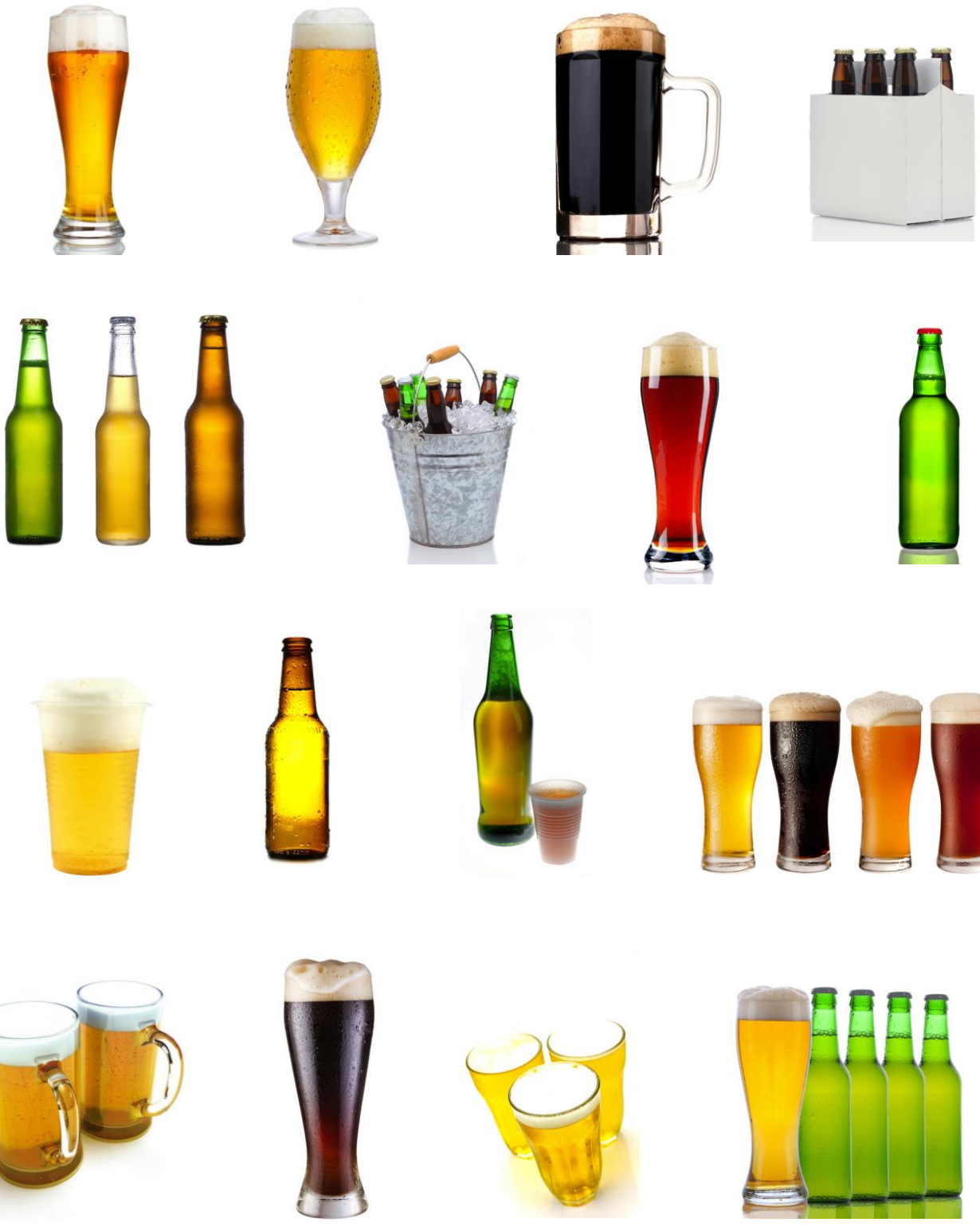












































Table 1

Images Used in Picture Presentations

#	Picture Category	# of Beverages	Type	Version 1- Picture Name	Version 2- Picture Name
1	IAPS	None	Neutral	7025	7000
2	IAPS	None	Positive	1710	2057
3	Alcohol	Multi	Wine	MultiWine2	MultiWine4
4	Alcohol	Single	Beer	Beer1	Beer2
5	IAPS	None	Negative	3051	6260
6	Alcohol	Single	Liquor	Liquor1	Liquor5
7	Alcohol	Multi	Liquor	MultiLiquor3	MultiLiquor4
8	IAPS	None	Neutral	7090	7002
9	IAPS	None	Positive	2070	4608
10	Alcohol	Multi	Liquor	MultiLiquor5	MultiLiquor9
11	IAPS	None	Neutral	7150	7050
12	Alcohol	Multi	Wine	MultiWine3	MultiWine7
13	IAPS	None	Negative	6313	3120
14	IAPS	None	Neutral	7170	7080
15	Alcohol	Single	Beer	Beer7	Beer8
16	IAPS	None	Negative	6560	6550
17	Alcohol	Multi	Liquor	MultiLiquor10	MultiLiquor2
18	Alcohol	Multi	Beer	MultiBeer3	MultiBeer1
19	Alcohol	Single	Liquor	Liquor3	Liquor7
20	IAPS	None	Neutral	7205	7100
21	Alcohol	Single	Wine	Wine8	Wine5
22	Alcohol	Single	Liquor	Liquor6	Liquor2
23	IAPS	None	Positive	4670	8210
24	Alcohol	Multi	Wine	MultiWine6	MultiWine9
25	IAPS	None	Negative	6243	3060
26	Alcohol	Multi	Beer	MultiBeer7	MultiBeer6
27	IAPS	None	Positive	2091	4680
28	IAPS	None	Neutral	7004	7140

#	Picture Category	# of Beverages	Type	Version 1- Picture Name	Version 2- Picture Name
29	IAPS	None	Negative	3261	6821
30	Alcohol	Single	Beer	Beer9	Beer6
31	IAPS	None	Negative	6510	6212
32	Alcohol	Single	Wine	Wine1	Wine6
33	IAPS	None	Positive	8031	2165
34	Alcohol	Multi	Wine	MultiWine5	MultiWine10
35	IAPS	None	Positive	4653	4669
36	Alcohol	Single	Beer	Beer3	Beer10
37	Alcohol	Multi	Liquor	MultiLiquor7	MultiLiquor6
38	Alcohol	Single	Wine	Wine9	Wine7
39	IAPS	None	Negative	3053	3400
40	IAPS	None	Neutral	7130	7175
41	Alcohol	Multi	Beer	MultiBeer11	MultiBeer9
42	Alcohol	Single	Wine	Wine3	Wine2
43	IAPS	None	Neutral	7010	7190
44	IAPS	None	Positive	8350	8470
45	Alcohol	Single	Liquor	Liquor4	Liquor8
46	IAPS	None	Negative	3550	3102
47	Alcohol	Multi	Wine	MultiWine8	MultiWine1
48	Alcohol	Single	Beer	Beer4	Beer11
49	Alcohol	Single	Liquor	Liquor11	Liquor9
50	IAPS	None	Neutral	7034	7217
51	Alcohol	Multi	Beer	MultiBeer2	MultiBeer8
52	IAPS	None	Positive	4599	2040
53	IAPS	None	Positive	8200	8497
54	Alcohol	Single	Wine	Wine10	Wine4
55	IAPS	None	Neutral	6150	7233
56	IAPS	None	Negative	3500	1301
57	IAPS	None	Negative	9400	6570
58	Alcohol	Multi	Beer	MultiBeer5	MultiBeer4
59	Alcohol	Multi	Liquor	MultiLiquor1	MultiLiquor8
60	IAPS	None	Positive	1601	1463

Table 2

Study 1 - Internal Consistency and Picture Category Means – Valence

Picture Category	Version 1 Cronbach Coefficient Alpha (Raw)	Version 2 Cronbach Coefficient Alpha (Raw)	Version 1 Mean, SD	Version 2 Mean, SD
Positive*	0.78	0.74	3.15, 0.90	2.63, 0.71
Negative	0.78	0.81	8.07, 0.78	8.20, 0.67
Neutral	0.79	0.80	4.93, 0.67	5.01, 0.67
All Beer	0.94	0.96	4.33, 1.12	4.21, 1.50
All Wine	0.94	0.96	4.23, 0.97	4.02, 1.39
All Liquor	0.83	0.86	4.31, 0.82	3.95, 1.12
All Alcohol	0.96	0.97	4.29, 0.82	4.06, 1.21
Single Beer	0.89	0.90	4.41, 1.14	4.32, 1.51
Single Wine	0.89	0.92	4.31, 1.07	4.15, 1.42
Single Liquor*	0.65	0.71	4.35, 0.91	3.88, 1.14
Multi Beer	0.91	0.92	4.24, 1.21	4.11, 1.53
Multi Wine	0.87	0.91	4.16, 0.92	3.88, 1.41
Multi Liquor	0.72	0.74	4.27, 0.82	4.02, 1.18

* $p < .05$, (significant main effect of version on ratings).

Table 3

Study 1 - Internal Consistency and Picture Category Means - Arousal

Picture Category	Version 1 Cronbach Coefficient Alpha (Raw)	Version 2 Cronbach Coefficient Alpha (Raw)	Version 1 Mean, SD	Version 2 Mean, SD
Positive	0.88	0.87	4.75, 1.75	4.69, 1.58
Negative	0.95	0.95	3.62, 1.73	3.37, 1.84
Neutral	0.90	0.91	7.08, 1.29	7.12, 1.53
All Beer	0.96	0.97	5.92, 1.80	5.84, 2.07
All Wine	0.95	0.97	6.18, 1.78	6.19, 2.09
All Liquor	0.94	0.95	6.00, 1.68	5.70, 2.04
All Alcohol	0.98	0.99	6.03, 1.66	5.91, 2.00
Single Beer	0.92	0.93	6.01, 1.84	5.91, 2.04
Single Wine	0.92	0.95	6.29, 1.88	6.31, 2.17
Single Liquor	0.87	0.91	6.08, 1.74	5.79, 2.11
Multi Beer	0.94	0.92	5.83, 1.92	5.76, 2.18
Multi Wine	0.89	0.92	6.06, 1.79	6.07, 2.08
Multi Liquor	0.88	0.90	5.92, 1.71	5.62, 2.06

Note: No significant main effects were observed.

Table 4

Study 2 - Internal Consistency and Picture Category Means - Valence

Internal Consistency			**Picture Category Means**		**Mean Differences in Ratings Between Versions**
Picture Category	**Version 1 Alpha (Raw)**	**Version 2 Alpha (Raw)**	**Version 1 Mean, SD**	**Version 2 Mean, SD**	**Mean Difference**
Positive	.68	.75	2.91, .68	2.89, .84	.03
Negative	.88	.76	8.13, .80	8.07, .68	.06
Neutral	.62	.66	5.11, .51	4.98, .54	.13
Beer	.95	.94	4.16, 1.28	4.51, 1.29	.35
Wine	.92	.93	4.18, 1.02	4.47, 1.06	.28
Liquor	.90	.80	4.05, 1.09	4.25, .90	.20
All Alcohol	.96	.95	4.13, 1.00	4.41, .94	.28

Note: No significant main effects were observed.

Table 5

Study 2 - Internal Consistency and Picture Category Means – Arousal

Internal Consistency			Picture Category Means		Mean Differences in Ratings Between Versions
Picture Category	**Version 1 Alpha (Raw)**	**Version 2 Alpha (Raw)**	**Version 1 Mean, SD**	**Version 2 Mean, SD**	**Mean Difference**
Positive	.89	.88	4.53, 1.69	4.67, 1.70	.15
Negative	.96	.90	4.02, 1.99	4.03, 1.64	.01
Neutral	.91	.92	6.73, 1.44	7.11, 1.52	.37
Beer	.96	.94	5.79, 1.85	6.39, 1.77	.60*
Wine	.96	.95	6.01, 1.83	6.54, 1.82	.54
Liquor	.94	.93	5.68, 1.81	5.99, 1.85	.48
All Alcohol	.98	.98	5.82, 1.76	6.31, 1.73	.31

* $p < .05$, (significant main effect of version on ratings).

Table 6

Study 2 - Convergent Validity & Exploratory Analyses

	Convergent Validity- Alcohol Valence		Exploratory- Alcohol Arousal	
Measure	**Version 1 Correlation Coefficient**	**Version 2 Correlation Coefficient**	**Version 1 Correlation Coefficient**	**Version 2 Correlation Coefficient**
Positive Expectancies	-.22*	-.14	-.13	-.09
Negative Expectancies	-.11	.26*	-.04	.25
Indulgent Approach	-.35**	-.51**	-.07	-.44**
Compelled Approach	-.40**	-.36**	-.21*	-.26*
Regulated Approach	.15	.25*	.01	.15
Days Drinking	-.30**	-.46**	-.20*	-.24
Average Drinks/Drinking Day	-.46**	-.39**	-.21*	-.41**
# of Binge Drinking Days	-.35**	-.42**	-.22*	-.26*
Total Drinks/Week	-.41**	-.47**	-.23*	-.26*

* $p < .05$, ** $p < .01$, (significant correlation coefficient).

Table 7

Study 2 Divergent Validity - IAPS Positive Ratings

	Divergent Validity- IAPS Positive Valence		**Divergent Validity- IAPS Positive Arousal**	
Measure	**Version 1 Correlation Coefficient**	**Version 2 Correlation Coefficient**	**Version 1 Correlation Coefficient**	**Version 2 Correlation Coefficient**
Positive Expectancies	-.10	.16	-.13	.14
Negative Expectancies	-.17	-.06	-.07	.12
Indulgent Approach	-.05	-.18	.09	-.27*
Compelled Approach	.03	-.11	.06	-.12
Regulated Approach	.04	.03	-.10	.10
Days Drinking	-.07	-.18	-.03	-.07
Average Drinks/Drinking Day	-.17	-.09	-.04	-.22
# of Binge Drinking Days	-.11	-.06	-.12	-.13
Total Drinks/Week	-.15	-.11	-.08	-.10

* $p < .05$, (significant correlation coefficient).

Table 8

Study 2 Divergent Validity - IAPS Negative Ratings

	Divergent Validity- IAPS Negative Valence		**Divergent Validity- IAPS Negative Arousal**	
Measure	**Version 1 Correlation Coefficient**	**Version 2 Correlation Coefficient**	**Version 1 Correlation Coefficient**	**Version 2 Correlation Coefficient**
Positive Expectancies	-.06	.21	.04	-.02
Negative Expectancies	.10	.09	.04	.27*
Indulgent Approach	-.18	-.05	-.07	.00
Compelled Approach	-.05	.08	.08	.11
Regulated Approach	.17	.11	.08	-.07
Days Drinking	-.13	-.10	-.17	-.05
Average Drinks/Drinking Day	-.10	-.11	-.11	-.01
# of Binge Drinking Days	-.20	-.16	-.16	.09
Total Drinks/Week	-.14	-.14	-.20*	.07

* $p < .05$, (significant correlation coefficient).

Table 9

Study 2 Divergent Validity - IAPS Neutral Ratings

	Divergent Validity- IAPS Neutral Valence		Divergent Validity- IAPS Neutral Arousal	
Measure	**Version 1 Correlation Coefficient**	**Version 2 Correlation Coefficient**	**Version 1 Correlation Coefficient**	**Version 2 Correlation Coefficient**
Positive Expectancies	-.04	.13	-.13	.05
Negative Expectancies	.02	-.20	.04	.17
Indulgent Approach	-.08	.08	-.02	-.24
Compelled Approach	.21*	.18	-.02	-.08
Regulated Approach	.09	-.10	-.07	-.03
Days Drinking	.01	-.24	-.15	-.19
Average Drinks/Drinking Day	-.08	-.09	-.10	-.29*
# of Binge Drinking Days	.03	-.12	-.17	-.15
Total Drinks/Week	-.03	-.12	-.15	-.14

* $p < .05$, ** $p < .01$, (significant correlation coefficient).

Table 10

Study 2 Between-Subjects Analysis of Variance Calculations: Arousal, Self-Report Measures

Between Subjects Effects					
Categorical Variable	**Continuous Variable**	**F**	**df**	**df error**	**Power Observed for Analysis**
Version of Picture Set	Beer Arousal*	4.12	1	150	0.64
Version of Picture Set	Binge Drinking*	4.48	1	149	0.77
Version of Picture Set	Compelled Approach*	4.31	1	149	0.77
Compelled Approach	Beer Arousal	1.23	20	131	1.00
Binge Drinking	Beer Arousal**	4.61	6	143	1.00

* $p < .05$, ** $p < .01$, (significant main effect).

Table 11

Final Picture Set Image Selections

#	Picture Category	Picture Set Origin	Picture Name	Item-Total Correlation Valence	Item-Total Correlation Arousal
1	Positive	1	8200	.52	.71
2	Positive	1	4599	.52	.71
3	Positive	1	1710	.40	.67
4	Positive	2	2040	.70	.69
5	Positive	2	2057	.51	.61
6	Positive	2	8497	.49	.74
7	Positive	2	8470	.46	.57
8	Positive	2	4669	.41	.58
9	Positive	2	2165	.40	.68
10	Positive	2	8210	.37	.48
11	Negative	1	6560	.73	.84
12	Negative	1	6510	.70	.82
13	Negative	1	3500	.68	.78
14	Negative	1	3051	.68	.77
15	Negative	1	9400	.67	.83
16	Negative	1	6243	.65	.69
17	Negative	1	3550	.64	.85
18	Negative	1	6313	.61	.83
19	Negative	2	3120	.66	.70
20	Negative	2	6570	.57	.69
21	Neutral	1	7004	.50	.77
22	Neutral	1	7170	.47	.59
23	Neutral	1	7025	.45	.53
24	Neutral	1	7090	.34	.59
25	Neutral	1	6150	.31	.78
26	Neutral	2	7190	.51	.68
27	Neutral	2	7175	.44	.65
28	Neutral	2	7002	.44	.74

#	Picture Category	Picture Set Origin	Picture Name	Item-Total Correlation Valence	Item-Total Correlation Arousal
29	Neutral	2	7050	.36	.62
30	Neutral	2	7233	.32	.77
31	Beer	1	MultiBeer3	.91	.84
32	Beer	1	MultiBeer5	.86	.90
33	Beer	1	Beer7	.85	.81
34	Beer	1	Beer9	.83	.86
35	Beer	1	MultiBeer11	.82	.86
36	Beer	1	Beer1	.79	.72
37	Beer	1	MultiBeer2	.79	.79
38	Beer	2	MultiBeer8	.85	.82
39	Beer	2	MultiBeer1	.79	.81
40	Beer	2	Beer2	.78	.72
41	Wine	1	Wine10	.81	.88
42	Wine	1	Wine1	.79	.85
43	Wine	1	MultiWine8	.77	.87
44	Wine	1	Wine3	.76	.88
45	Wine	1	MultiWine5	.72	.80
46	Wine	2	Wine2	.86	.92
47	Wine	2	MultiWine1	.83	.87
48	Wine	2	Wine6	.80	.82
49	Wine	2	MultiWine7	.77	.82
50	Wine	2	MultiWine10	.75	.88
51	Liquor	1	MultiLiquor1	.74	.79
52	Liquor	1	MultiLiquor10	.72	.82
53	Liquor	1	Liquor4	.71	.80
54	Liquor	1	MultiLiquor5	.70	.74
55	Liquor	1	MultiLiquor3	.65	.77
56	Liquor	1	Liquor1	.65	.69
57	Liquor	1	Liquor3	.64	.83
58	Liquor	1	MultiLiquor7	.61	.71
59	Liquor	2	MultiLiquor2	.70	.79
60	Liquor	2	MultiLiquor6	.68	.84

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Vita

NAME OF AUTHOR: Kelsey Martha Krueger

PLACE OF BIRTH: Buffalo, New York, USA

DATE OF BIRTH: September 11th, 1989

UNDERGRADUATE SCHOOL ATTENDED:

St. John Fisher College, Rochester, NY

DEGREE AWARDED:

Bachelor of Arts in Psychology & Biology, 2011, St. John Fisher College

PROFESSIONAL EXPERIENCE:

Instructor, Department of Psychology, Syracuse University, 2014-2015

Therapist, Psychological Services Center, Syracuse University, 2013-2014

Lab Instructor, Department of Psychology, Syracuse University, 2012-2013

Teaching Assistant, Department of Psychology, Syracuse University, 2011-2012