DRUG-INDUCED ATAXIA:

EFFECT OF THE SELF-ADMINISTRATION CONTINGENCY

By

LORRAINE ANN WEISE-KELLY

A Thesis

Submitted to the School of Graduate Studies

in Partial Fulfilment of the Requirements

for the Degree

Doctor of Philosophy

McMaster University

DRUG-INDUCED ATAXIA

DOCTOR OF PHILOSOPHY (1999) McMaster University
(Psychology) Hamilton, Ontario

TITLE: Drug-Induced Ataxia: Effect of the Self-Administration Contingency

AUTHOR: Lorraine Ann Weise-Kelly, B.A. (Wilfrid Laurier University)

SUPERVISOR: Professor Shepard Siegel

NUMBER OF PAGES: viii, 162

Abstract

Some studies have demonstrated that the effects of a drug may be different, depending on whether the drug is self-administered or passively received by the subject. Most of the studies which have examined this phenomenon have not examined the effects of a drug following each of a series of administrations. Moreover, the mechanism mediating differences between self-administered and passively received drugs has not been determined. The present experiments used a yoked-control design to examine the development of tolerance to the ataxic effects of heroin and of ethanol in rats that self-administer the drugs and rats that passively received them. Results demonstrate that rats that passively received heroin, but not those that self-administered the drug, were significantly impaired following the initial administrations. During the first administration sessions, rats that self-administered ethanol were as impaired as their partners that passively received, but within a few sessions self-administering rats developed tolerance to the ataxic effect of the ethanol, while their yoked partners did not. The results also suggest that the faster tolerance development in rats that self-administered ethanol may have been mediated by differences in Pavlovian conditioning in these subjects, which demonstrated larger compensatory conditional responses in the form of "hypertaxia" than did their yoked partners. The results indicated that some component of the self-administration process contributed to the Pavlovian conditioning, and hence, faster tolerance development, of self-administering

animals. The data suggest that studies in which drugs are passively received may overestimate the dose that is necessary to produce tolerance in self-administering animals. Models based on such studies, then, may require modification before they are applied to situations which involve self-administration of drugs.

Acknowledgements

I am indebted to many people who have supported and assisted me during my 5 years at McMaster. First, I thank my supervisor, Shepard Siegel, who has taught me to be a scientist and who has always been supportive and given me good guidance. Thank you, also, to my committee members, Ron Racine and Harvey Weingarten, for your insightful comments and direction.

I owe a great deal of gratitude to Stephanie Hevenor, who did all of my programming. Thank you for your help and your friendship.

I am grateful to the Siegel lab members who have made my time at McMaster so enjoyable. Thank you Doreen for teaching me the importance of inner peace and for helping me meet many challenging situations. Thank you Susan for your advice and for being a fantastic friend. Thank you Bob for teaching me that one can be successful and yet not worry. I also thank Marta, Marco, and Joe, who made the lab a fun place to be.

Thank you to my friends who continuously told me that I could do it, who have listened to my obsessing, and who have reminded me that there is life outside of the lab. Thank you all so much.

I have been fortunate to have very supportive parents. Thanks, Mom and Dad, for believing in me and teaching me to do my best. Thank you, Patti, for your support and for being a great sister and friend. And finally, thank you Bill for wanting nothing more than my happiness, for your endless patience, for your help in the lab, and for not falling asleep every time I practiced a talk.

TABLE OF CONTENTS

List of Figures

Most cases of human drug use involve self-administration of drugs. Many of the experiments designed to contribute to the understanding of drug tolerance and withdrawal have studied passively received drugs. Thus, many models of drug effects and drug tolerance and withdrawal are based on studies in which the experimenter -- not the subject -- administers the drug. There is some evidence, however, that the effects of many drugs differ, depending on whether administration of the drug is response-contingent or non-contingent.

There have not been many studies specifically designed to evaluate the differential effects of self-administered and passively received drugs. Ator and Griffiths (1993) examined the role of the self-administration contingency on sensitivity to the discriminative stimulus effect of intravenously administered midazolam. They found that two baboons were more sensitive to the discriminative stimulus effect of the benzodiazepine when they self-administered the drug than when it was passively received. Moolten and Kornetsky (1990) examined the capacity of ethanol to decrease the threshold of rewarding electrical brain stimulation, a putative measure of drug reward. They found that rats that orally self-administered ethanol demonstrated a significant increase in sensitivity to rewarding electrical brain stimulation, but that rats that received intragastrically administered ethanol at the same rate as self-administering subjects showed no ethanol-induced change. Moolten and Kornetsky's (1990) results suggest that the response-contingency increased the rewarding value of ethanol. Additional research has found that subjects that self-administer opiates have different rates of neurotransmitter turnover (Smith, Co, Freeman, & Lane, 1982; Smith, Co, Freeman, Sands, & Lane, 1980; Smith, Co, & Lane, 1984a) and different receptor densities (Smith, Co, & Lane, 1984b) than do rats that receive equal volumes of response-independent opiates. Recently, Baptista, Weise-Kelly, MacQueen, Young and Siegel (in preparation) found that rats that self-administered heroin had smaller heroin-induced changes in c-fos levels in the striatum than did yoked rats that passively received the same doses of heroin at the same times. It has also been found that the neurochemical effects of cocaine are different in rats that self-administer the drug and those that passively receive it (Kiyatkin & Stein, 1995; Wilson, et al., 1994; Wise, et al., 1995).

Findings that the effect of a drug may be less pronounced if the drug is self-administered than if it is passively received suggest that self-administration accelerates the rate of tolerance development. Mello and Mendelson (1970) permitted alcoholic men to drink alcohol in each of two conditions: whenever they wanted (spontaneous condition) or only when instructed to do so by the experimenter (programmed condition). They found that alcoholic men demonstrated greater tolerance to the effects of the alcohol when they were in the spontaneous condition than when they were in the programmed condition. Other researchers have also reported that the effect of a self-administered drug is greater than the effect of a passively received drug. Ehrman, Ternes, O'Brien, and McLellan (1992) studied the effects of opiate administrations on detoxified opiate addicts.

They found that although the men demonstrated opiate-induced changes in heart rate and skin temperature if the drug was administered by the experimenter, they were tolerant to these effects of the drug if it was self-administered. The men did not, however, report any differences in the subjective effects of self-administered and passively received opiates. Donny, Cagguila, Knopf, and Brown (1995) examined the effects of nicotine on the levels of epinephrine and norepinephrine. They used a yoked-control design, such that each time a self-administering subject made a particular response in its operant chamber, it and its yoked partner received equivalent doses of nicotine. Donny and colleagues (1995) found that although rats that self-administered nicotine did not demonstrate changes in plasma epinephrine and norepinephrine levels, yoked subjects that passively received nicotine experienced elevations in the levels of these hormones.

Particularly convincing evidence for the significance of the self-administration contingency in tolerance development is provided by reports that drugs are less toxic if they are self-administered than if they are passively received. For example, Johanson and Schuster (1981) found that experimenter-administered phencyclidine can be lethal to monkeys at, or even below, doses which are safe when self-administered by monkeys. Using a yoked-control design, Dworkin, Mirkis, and Smith (1995) found that cocaine-induced deaths occurred much less frequently in rats that self-administered cocaine than in yoked rats that passively received the same doses of the drug at the same times.

There is evidence that the response contingency also affects the severity of withdrawal symptoms, such that withdrawal symptoms are greater if the drug had been self-administered, rather than passively-received. In their examination of the role of self-administration on the effects of ethanol, Mello and Mendelson (1970) found that withdrawal effects were more frequent following the spontaneous condition than the programmed condition. MacRae and Siegel (1997) used a yoked-control design to examine the role of self-administration in opiate withdrawal in rats. They found that, upon cessation of morphine administration, withdrawal symptoms were more frequent in rats that had self-administered the drug than in their yoked partners.

In summary, the few studies that have examined the role of the self-administration contingency have demonstrated that a drug has a different effect if it is self-administered than if it is passively received. Most of these studies have not looked at the effects of the drug after each administration, and, therefore, have not examined the development of tolerance. The present experiments were designed to examine the role of self-administration in the development of tolerance to the behaviorally impairing, or ataxic, effect of heroin and of ethanol. Experiment 1 was designed to examine ataxia induced by self-administered and passively received heroin over repeated administrations. Experiments 2 and 3 were designed to assess the ataxic effect of self-administered and passively received ethanol over repeated administrations. A second goal of Experiment 3 was to assess Pavlovian conditioning as a mechanism mediating the differences between self-administered and passively received drugs.

Experiment 1

There are reports of differences in the effects of self-administered and passively received opiates. Some of these studies have looked at the role of the response contingency in opiate-induced neurochemical (e.g., Baptista et al., in preparation; Smith et al., 1980, 1982, 1984a,b) and physiological (Ehrman et al., 1992) effects, while MacRae and Siegel (1997) looked at the role of the response-contingency on opiate withdrawal. Although opiates are known to induce analgesia (e.g., Krank, Hinson, & Siegel, 1981; Siegel, 1975) and behavioral impairment (e.g., Kissin, Brown, Robinson, & Bradly, 1991; Kissin, Kerr, & Smith, 1983; Vaupel, McCoun, & Cone, 1984; Yang, Weinger, & Negus, 1992), there have not been any examinations of the role of the self-administration contingency in opiate-induced analgesia and behavioral impairment. The present experiment was designed to examine the development of tolerance to the analgesic and ataxic effects of intravenously administered heroin in rats that self-administer the opiate and their yoked partners that passively receive the drug.

Opiate-induced behavioral impairment has been demonstrated in rodents using tests such as the righting reflex (e.g., Kissin et al., 1991; Kissin, et al., 1983; Yang et al., 1992) and the rotarod (e.g., Vaupel et al., 1984). A particularly useful and practical means of assessing drug-induced behavioral impairment in the rat is the tilting plane test, which was developed by Arvola, Sammalisto, and Wallgren (1958) and has been used to examine ethanol-induced behavioral impairment (e.g., Eickholt, Schillaci, & Searcy, 1967; Larson & Siegel, 1998; Siegel & Larson, 1996). Opiate-induced analgesia has been demonstrated using the hot-plate test (e.g., Siegel, 1976; Siegel, Hinson, & Krank, 1981). The present experiment used the tilting plane to assess heroin-induced ataxia, and the hot-plate test to assess heroin-induced analgesia, in rats that self-administered heroin and those that passively received the drug.

Method

Subjects and Surgical Preparation

The subjects were 59, experimentally-naive, male, Long-Evans hooded rats (obtained from Charles River, Quebec), weighing between 385 and 500 g at the time of surgery. The animals were individually housed in clear plastic cages in a colony maintained on a 12:12 h light:dark cycle. The experiment was run during the light phase. Subjects had ad libitum access to food and water in the home cage.

A chronic catheter was surgically implanted in the right jugular vein of each subject, under ketamine and xylazine anaesthesia. The tip of the catheter was made of polyethylene tubing (PE-10), and was placed approximately 1 cm from the heart. The catheter was anchored to the vein and passed subcutaneously to the back of the rat, where it exited through a lead made of a hollowed plastic bolt and nylon mesh. The lead portion of the catheter was anchored under the skin. The catheter was flushed with a solution of heparin and ampicillin in physiological saline and sealed with a push-on cap made of silastic tubing. Patency of the catheters was checked periodically during the recovery period and daily throughout the experiment with heparinized saline. Subjects were permitted to recover from surgery for at least 1 week.

Drugs

A solution of .1 mg/ml heroin (diacetylmorphine hydrochloride, MacFarlan Smith) dissolved in physiological saline was used. The solution was infused at a rate of .035 ml/sec for a 3 sec period; thus, each infusion consisted of .0105 mg of heroin administered in .105 ml of solution. Saline infusions consisted of .105 ml of saline administered over a 3 sec period.

Apparatus

Experimental chambers. Three identical operant chambers (30.4 X 24.0 X 25.4 cm; Lehigh Valley Electronics), each equipped with one response lever, were used. In each chamber, a stimulus light was centered at the top of the front panel. A houselight was located just above the clear Plexiglas top of the operant chamber. Each chamber was located in a sound-attenuating, vented cubicle. A hydraulically sealed swivel with a Minisart sartorius .20 μm filter was fitted in each cubicle. Subjects were connected to the swivel and filter by Silastic tubing (0.3 mm i.d., 0.64 mm o.d.) surrounded by a metal spring. The spring attached to the bolt of the catheter lead by a threaded collar. The swivel and filter were connected by Masterflex Tygon tubing to a 5 ml syringe held in a 5-syringe Harvard Apparatus Compact Infusion Pump.

Lever presses in the chamber designated to be the "executive chamber" resulted in activation of the pump. The pump held the 3 syringes, and therefore, its activation led to infusions to the subjects in the executive chamber and the two other, non-executive, chambers. During infusions, the houselight of each chamber was turned off and each stimulus light was turned on. Lever presses in either of the non-executive chambers resulted only in the houselight turning off in that particular chamber. A computer located outside the experimental room controlled drug delivery and recorded information regarding the occurrences of drug deliveries and lever presses by the subject in each chamber.

Impairment measurement. A tilting plane was used to assess ataxia. The apparatus consisted of a Plexiglas alley, open at the top, measuring 60 cm long X 18 cm wide X 30 cm high. One 18 cm end of the plane was hinged to a horizontal surface. The unhinged 18 cm end of the alley was elevated by operation of a crank and pulley system. Inclination of the plane occurred at a rate of 4°/sec. A protractor fixed to the pivoting point at the hinged end of the plane was used to determine the angle of the plane.

To assess ataxia, a rat was placed at the non-hinged end of the plane. The end was elevated, and the angle of the plane when the subject began to slip was determined. This angle was recorded as the slip angle. The tilting plane was located in an experimental room separate from that in which the operant chambers were located.

Procedure

Subjects were assigned to triads, such that the subjects in each triad were of approximately equal weight. Within each triad, each subject was randomly assigned to one of 3 groups: self-administering heroin (SA-H), yoked heroin (Y-H) and yoked saline control (Y-C).

On each day, the pre-administration slip angle of each subject was assessed on the tilting plane. Following this evaluation, subjects were placed in the operant chambers, with subjects assigned to the SA-H group being placed in the executive chamber. Each subject was then connected to the drug delivery system. One experimenter-administered "prime" infusion was administered to each subject at the beginning of each experimental session. The prime consisted of heroin for SA-H and Y-H subjects and saline for Y-C subjects. Following delivery of the prime, all drug and saline infusions were contingent upon the lever presses by the SA-H subject. After 45 min in the experimental chamber, each subject was removed from its chamber and returned to the tilting plane. Three post-administration slip angle assessments were conducted on each subject within 5 min of removal from the operant chamber. A subject's impairment score was determined by subtracting the pre-administration slip angle from the smallest post-administration slip angle. More negative impairment scores, then, reflect greater impairment.

All triads began the experiment on a continuous reinforcement (CRF) schedule, such that each lever press by an SA-H subject produced a drug infusion. Beginning on the fourth session, each SA-H subject could move, depending on its response pattern during the previous session, from the CRF schedule to a fixed ratio-3 schedule (FR-3), which required 3 lever pressed for each drug infusion. Subsequent schedules required 6 (FR-6) and 10 (FR-10) lever presses per infusion, respectively. During each session, only one schedule was in effect for each SA-H subject. To move from one schedule to the next schedule, an SA-H subject had to have earned a drug infusion during the first 5 min of the previous session. If an SA-H rat failed to earn a drug infusion during one entire session, then during the next session it was returned to the previous schedule. Thus, each triad moved through these schedules at its own rate, as it met the criterion for moving from one schedule to the next. During the FR schedules, each lever press made by a self-administering rat resulted in the offset of the houselight and onset of the stimulus light in each chamber.

Each triad participated in the experiment once a day. On some sessions, a self-administering subject failed to make the lever presses necessary to earn a response-contingent infusion. Only data from those sessions during which response-contingent heroin infusions were administered were included in analyses. A triad completed the experiment when it had received response-contingent infusions on 8 sessions.

Analgesia assessment. Immediately upon removal from the experimental chamber, each subject was assessed for heroin-induced analgesia using the hot-plate test. The apparatus was a copper plate (30 cm X 16 cm X 0.5 cm) which was immersed completely in a water bath maintained at a constant temperature of 52 (+/- 0.2) °C. A dry surface on which sensitivity to thermal stimulation could be measured was created by fixing a cylinder (inner diameter of 12.5 cm), made of clear Plexiglas, to the plate with a watertight seal. Analgesia was measured by placing the subject on the enclosed dry surface and measuring the latency of the first response to the heat. A response was defined as either the licking of a rear paw or a jump such that all four paws were off the surface of the plate. Subjects were confined on the hot-plate surface for 30 sec, regardless of when they responded to the stimulation.

The hot-plate scores of SA-H and Y-H subjects did not differ from those of Y-C subjects, even on the first block of administrations. The dose of heroin administered may have been too small to induce analgesia. Therefore, analgesia assessment data are not included here.

Results and Discussion

Data Management

Some subjects were unable to complete the experiment due to catheter problems. These subjects, and the other members of their triads, were eliminated from the study. The experiment was completed with 14 triads. The data from eliminated triads are not presented and were not included in any analyses. The data from the 8 sessions were collapsed into 4 blocks of 2 sessions each.

Heroin Administered

The amount of heroin delivered to SA-H and Y-H subjects was equated for volume. Differences in weights between subjects in these groups could have resulted, then, in differences in the doses delivered. Figure 1 presents the mean dose of heroin delivered to subjects in the SA-H and Y-H groups on each of the 4 blocks. A Group X Block repeated measures analysis of variance (ANOVA) of these data indicated that there were no differences approaching significance in the doses administered to these groups, nor in the doses administered across blocks. Although heroin administration was equated for volume, there also were no differences in the doses delivered to subjects in SA-H and Y-H groups.

Insert Figure 1 about here

Pre-Administration Slip Angles

Figure 2 presents the mean pre-administration slip angles for each of the 3 groups across the 4 blocks. A Group X Block mixed-design ANOVA of the data presented in Figure 2 indicted that there were no differences approaching significance in pre-administration performance on the tilting plane between groups or across blocks. Thus the post-administration scores of each group were compared to a similar baseline.

Insert Figure 2 about here

Ataxia

Figure 3 depicts the mean impairment scores for each group on each block. A Group X Block repeated measures ANOVA of these data indicated that there was a significant interaction between these factors, $F(6,78)=3.49$, $p<.005$. Tukey HSD post hoc analyses of these data indicated that on Block 1, the Y-H group ($p<.05$), but not the SA-H group ($p>.05$), demonstrated impairment scores that were significantly different from those of the Y-C group. These data indicate, then, that only those subjects that passively received the heroin were significantly impaired by it during Block 1.

On Blocks 2 through 4, impairment scores of Y-H subjects were no longer significantly different from those of Y-S subjects (all ps>.1). Thus, subjects that passively received heroin became tolerant to the drug's behaviorally impairing effect. The impairment scores of the SA-H group also increased, such that on Blocks 3 and 4, their scores were significantly higher than those of the Y-C group (both ps <.001). The enhanced ability to stay at the end of tilting plane as it is tilted is referred to as "hypertaxia" (Larson & Siegel, 1998).

Insert Figure 3 about here

The results of this experiment demonstrate that heroin has a different effect in rats that self-administer it than in those that passively-receive the same doses at the same intervals. Rats that passively received heroin, but not those that self-administered it, were behaviorally impaired following the initial administrations. The results also indicate that rats develop tolerance to the ataxic effect of passively-received heroin, such that after repeated administrations they no longer experience heroin-induced ataxia. In contrast, animals that self-administer heroin do not demonstrate behavioral impairment, but do develop heroin-induced hypertaxia over administration sessions.

The mechanism for differences between self-administered and passively received drugs is not clear. Recently, MacRae and Siegel (1997) suggested that Pavlovian conditioning may mediate the differences in opiate effects between animals that self-administer the drug and those that passively receive it. The possibility that Pavlovian conditioning mediates the differences between self-administering subjects and those that passively receive the drug is explored in Experiment 3.

Experiment 2

The purpose of this experiment was to assess the ataxic effect of self-administered and passively-received ethanol over repeated administrations. Ethanol was used in the present experiment to determine whether the difference in ataxia between self-administered and passively-received heroin generalized to another drug.

The tilting plane has been used by others to measure ethanol-induced ataxia (e.g., Eickholt, et al., 1967; Larson & Siegel, 1998; Siegel & Larson, 1996), and is used in the present experiment. Self-administering subjects orally consumed a sweetened ethanol solution, while their yoked partners were intragastrically infused with equivalent doses of the solution.

Method

Subjects and Surgical Preparation

The subjects were 42 experimentally-naive, male, Long-Evans hooded rats (obtained from Charles River, Quebec), weighing between 235 and 335 g at the beginning of the experiment. Animals were housed as described in Experiment 1, with the exception that they were deprived of water for 16 hr prior to the experimental session each day.

Part way through the experiment subjects were surgically implanted with intragastric catheters under ketamine and xylazine anaesthesia, using a technique modified from that of Cox (1990). The catheter was made of silastic tubing, with two balls of silastic glue at one end and a 20 gauge hypodermic needle at the other. The end with the balls was anchored in the stomach, with one ball inside the stomach and the other outside the stomach wall. Purse string sutures tightened around the catheter between the balls held the catheter in place. The end with the needle was passed subcutaneously to the top of the head where it was anchored with dental cement. The catheters were sealed with threaded, plastic caps. The catheters were flushed daily with sterile water throughout recovery and the experiment. Subjects were permitted to recover from surgery for at least 1 week before the experimental procedure continued.

Drugs

Three-, 6-, and 12-% ethanol solutions were prepared by volume from 100% ethanol and a sweet solution. The sweet solution consisted of a highly palatable (Sclafani & Nissenbaum, 1985) mixture of 3% dextrose and .16% saccharin dissolved in water.

Apparatus

Experimental chambers. Twelve identical clear Plexiglas chambers (25 X 25 X 25 cm), each with a grid floor and equipped with a bottle and drinking spout, were used. The chambers were linked in triads, such that within each triad, one chamber was assigned to be the executive chamber to which the 2 non-executive chambers were yoked. Each subject placed in a non-executive chamber was connected to a Masterflex pump by Masterflex Tygon tubing surrounded by a metal spring. The tubing and spring were connected to the rat's catheter by a threaded, plastic connecter.

The bottle fitted to each executive chamber contained a solution and was connected to a lickometer. Whenever a subject in one of these chambers licked the spout a circuit was completed and the 2 pumps linked to its yoked chambers were activated for the duration of the licking bout plus 5 sec. The pumps were calibrated so that the volume of fluid orally consumed by the subject in the executive chamber was intragastrically infused into the subjects in each of the yoked chambers at a rate of approximately 1.6 ml/min. This rate of administration was determined in pilot studies to equal the rate at which a rat orally consumed fluid from a drinking bottle. The bottles fitted to the yoked chambers were empty. The chambers were located in a distinct experimental room.

Impairment measurement. The tilting plane described in Experiment 1 was used to assess ataxia.

Procedure

Pretraining. Following 16 hr of water deprivation, each subject was given the opportunity to drink sweet solution in the home cage for 30 min. The amount consumed was measured and recorded. This procedure was repeated once a day for 7 days.

Surgeries. Following pretraining, all subjects were surgically implanted with intragastric catheters as described in the Subjects and Surgical Preparation section.

Tolerance development. Subjects were assigned to triads based on their fluid consumption during pretraining, such that the subjects in each triad drank approximately equal volumes of solution per kg body weight on the last 3 days of pretraining. The subjects in each triad were randomly assigned to 3 groups; self-administering (SA-E), yoked-ethanol (Y-E), and yoked-sweet solution control (Y-C).

At the beginning of each session, each subject's pre-administration slip angle was determined. Subjects were then placed in the experimental chambers, with each SA-E subject being placed in an executive chamber. The catheters of Y-E and Y-C subjects were connected to the drug delivery system. SA-E rats were given access to the sweetened ethanol solution in bottles fixed to their chambers. The concentration of ethanol in the sweet solution was increased, such that the 3% solution used on session 1 was increased to 6% on days 2 and 3, and 12% on all subsequent days. As SA-E subjects drank from their bottles, the pumps simultaneously infused the Y-E and Y-C subjects with equal volumes per kg of sweet-ethanol and sweet-non-ethanol solutions, respectively. The amount of ethanol solution consumed by SA-E subjects was determined by subtracting the amount of solution left in the bottle at the end of the session from the original amount. The amounts of solution consumed by SA-E and infused into yoked subjects were recorded.

After 30 min in the experimental chambers, each triad was removed from the chambers. Each animal was tested on the tilting plane, once at each of 3, 5-min intervals, and its post-administration slip angles were determined. A subject's impairment score was determined by subtracting the pre-administration slip angle from the smallest post-administration slip angle. More negative impairment scores, then, reflect greater impairment. This procedure took place once a day for 20 days.

Results and Discussion

Data Management

Due to catheter problems, some subjects were unable to complete the experiment. These subjects and the other members of their triads were eliminated from the study. The experiment was completed with 8 triads. The data from eliminated triads are not presented and were not included in any analyses.

Ethanol Administered

The amounts of ethanol delivered to SA-E and Y-E subjects were equated for volume. Differences in weights between subjects in these groups could have resulted, then, in differences in doses delivered. The mean doses of ethanol administered to the SA-E and Y-E groups across 10 blocks of 2-sessions each are presented in Figure 4. A Group X Block repeated measures ANOVA of these data indicated that there were no differences approaching significance in the doses of in ethanol administered to these groups. There was a Block effect, $F(9,63)=2.05$, $p<.05$. Tukey post hoc analyses indicated that this effect was due to higher ethanol intake on Blocks 3 and 7 than Block 1 (both $ps<.05$).

Insert Figure 4 about here

Although ethanol administration was equated for volume, there was no difference in the doses delivered to subjects in SA-E and Y-E groups.

Pre-Ethanol Slip Angles

Figure 5 presents the mean pre-ethanol slip angles for each of the 3 groups across the 10 blocks.

Insert Figure 5 about here

A Group X Block mixed-design ANOVA of the data presented in Figure 5 indicted that there was a significant effect of group, $F(2,21)=5.13$, $p<.05$. Tukey HSD post hoc analyses of these data indicated that groups SA-E and Y-E demonstrated lower scores than did group Y-C (both $ps<.05$). There was also a significant effect of Block, $F(9, 189)=4.38$, $p<.001$.

Ataxia

Figure 6 presents the mean impairment scores for the SA-E, Y-E and Y-C groups across the 10 blocks of 2-session each. A Group X Block repeated measures ANOVA of these data indicated that there was a significant difference between groups,

$F(2,14)=34.05$, $p<.001$. Tukey HSD post hoc analyses indicated that each group differed from every other group (all ps<.005).

Insert Figure 6 about here

These results indicate that, although they received the same doses of ethanol at the same times, animals that received ethanol in a non-contingent manner were significantly more impaired by the drug than were their partners that self-administered the drug. The results of this study are similar to Mello and Mendelson's (1970) finding that alcoholic men were less affected by ethanol when they voluntarily drank alcoholic drinks than when they consumed the same amounts of the alcoholic drinks on an experimenter-determined schedule.

In the present experiment, SA-E subjects drank ethanol in sweet solution and Y-E subjects had the solution delivered directly to their stomachs. These groups differed in their route of administration. Furthermore, as described above, the amount consumed by SA-E subjects was calculated by determining the amount of fluid absent at the end of the session. There may have been some spillage, thereby resulting in Y-E subjects actually receiving more ethanol than their SA-E partners. Experiment 3 was designed to evaluate the effects of the self-administration contingency on the ataxic effect of ethanol in a preparation that does not possess these potential confounds.

Experiment 3

The results of Experiment 2 indicate that SA-E subjects were less impaired by ethanol than were their Y-E partners. One purpose of the present experiment was to examine the differences between self-administered and passively received ethanol with a procedure that eliminates the potential confounds of Experiment 2. Therefore, in the present experiment, both yoked and self-administering subjects received ethanol intragastrically.

A second purpose of Experiment 3 was to examine the mechanism that mediates the differences in ethanol-induced impairment between animals that self-administer ethanol and those that passively receive the drug. The bases for the differences between self-administered and passively received drugs are not yet clear, and have not been directly explored. However, MacRae and Siegel (1997) have suggested that Pavlovian conditioning may mediate differences in tolerance development and withdrawal between subjects that receive contingently- and non-contingently-administered drugs.

Over repeated administrations of a drug, Pavlovian conditioning may occur, and an association between drug-paired cues and the drug effect (unconditional stimulus; US) may be learned. When this occurs, the cues become conditional stimuli (CSs) and acquire the ability to elicit conditional responses (CRs), which usually counter the drug effect and result in tolerance (see Ramsay & Woods, 1997; Siegel, 1989). Presentation of a CS in the absence of the drug effect (US) results in the expression of CRs, since the CRs are unopposed by the drug effect. In the circumstance in which they are unopposed by the drug effect, CRs are known as withdrawal symptoms. The second goal of the present experiment was to assess the role of Pavlovian conditioning in the differences in ethanol-induced ataxia experienced by subjects that self-administer ethanol and those that passively receive it.

General Methods

Design

The experiment consisted of three phases: Tolerance Development, CR test, and US Only test. During the Tolerance Development phase, each triad was placed in the experimental chambers, and self-administering subjects were given the opportunity to self-administer ethanol by drinking an ethanol-free sweet solution. As each self-administering subject consumed the sweet solution, it and its yoked partners were intragastrically infused with the appropriate ethanol and ethanol-free solutions.

On sessions 5, 6, 15, and 16 of the Tolerance Development phase, some subjects underwent CR tests. For each triad participating in the CR test, on one of sessions 5, 6, 15, and 16, all ethanol solutions normally infused during Tolerance Development were replaced with ethanol free sweet solution. Thus, the typical ethanol-paired cues were presented in the absence of ethanol, therefore permitting expression of the CR to be uncountered by the ethanol effect. If Pavlovian conditioning contributed to the faster tolerance development of self-administering subjects, then those subjects should demonstrate larger CRs than their partners that passively received ethanol.

One day following the final session of the tolerance development phase, some triads participated in the US Only test. During this test, the roles of SA-E and Y-E subjects were reversed, such that subjects that normally were yoked now self-administered, and vice versa. This test was used to determine whether the process of self-administration contributed to the tolerance experienced by self-administering subjects, as suggested by MacRae and Siegel (1997). If some component of the self-administration process served as a CS for self-administering subjects, then eliminating this cue should result in a loss of tolerance for subjects that previously self-administered ethanol.

Subjects and Surgical Preparation

The subjects were 153 experimentally naive, male, Long-Evans rats (obtained from Charles River, Quebec), weighing between 250 and 400 g at the beginning of the experiment. Subjects were housed as described in Experiment 1, except that they were deprived of water as described in the Method section. Part way through the experiment, all subjects had intragastric catheters surgically implanted as described in Experiment 2.

Drugs

The sweet solution described in Experiment 2 was used. Twenty- and 33% ethanol solutions were prepared by volume from 100% ethanol and the sweet solution.

Apparatus

Experimental chambers. Six of the chambers described in Experiment 2 were used and operated as described in Experiment 2, with the following exceptions. The subjects in each executive chamber, like those in yoked chambers, were connected to a drug infusion pump. The bottle fitted to each executive chamber contained ethanol-free sweet solution and was connected, via a lickometer, to 3 pumps. Whenever a subject in one of the executive pumps licked the spout, the 3 pumps were activated for the duration of the licking bout plus an additional 5 sec. The first pump was calibrated, as indicated by pilot studies, so that for every 3 g of sweet solution orally consumed by the subject in the executive chamber, the subject was simultaneously intragastrically infused, at a rate of approximately 2.3 ml/min, with 4.5 g of 33% ethanol solution. Simultaneously, the second pump infused 7.5 g of 20% ethanol solution, at a rate of approximately 3.9 ml/min, through the intragastric catheter of a yoked subject assigned to passively receive ethanol. Similarly, as the SA-E subject orally consumed 3 g of sweet solution, the third pump infused 7.5 g of ethanol-free sweet solution into the intragastric catheter of the third member of the triad, the yoked control subject. Thus, for every 3 g of sweet solution drank by the SA-E subject, both ethanol subjects received 1.5 g of ethanol and all three subjects received a total of 7.5 g of solution (see Appendix A).

Impairment measurement. The tilting plane described in Experiment 1 was used to assess ataxia.

Method

Pretraining

Following 16 hr of water deprivation, a drinking bottle of sweet solution was placed in the home cage of each subject for 30 min. The amount of solution consumed by each subject during this time was recorded. This procedure was repeated once a day for 7 days.

Surgeries

Following pretraining, all subjects were surgically implanted with intragastric catheters as described in the Subjects and Surgical Preparation section.

Tolerance Development

Subjects were assigned to triads based on their pretraining fluid consumption, such that the subjects in each triad drank approximately equal volumes of solution per kg body mass on the last 3 days of pretraining. Within each triad, subjects were randomly assigned to 3 groups; self-administering (SA-E), yoked ethanol (Y-E), and yoked sweet solution control (Y-C).

Animals were deprived of water for 16 hrs prior to the first 6 trials and 22 hours prior to the remaining trials. Each triad of subjects was transported to the experimental room where pre-trial slip angles were measured on the tilting plane. Subjects were then transported to a second experimental room where they were placed in the operant chambers and their catheters were connected to the tubing leading from the infusion pumps. In the chambers, SA-E subjects were given access to sweet solution. Consumption amounts and the amounts infused were recorded over the 30 min consumption period.

Upon completion of the consumption period, each triad was removed from the experimental chambers and returned to the room with the tilting plane. Each animal was tested on the tilting plane, once at each of 3, 5-min intervals, where its post-ethanol slip angles were determined. A subject's impairment score was determined by subtracting the pre-ethanol slip angle from the smallest post-ethanol slip angle, and thus more negative impairment scores reflect greater drug-induced impairment. This procedure took place once a day for 20 days.

CR Test

Seventeen randomly selected triads completed the CR test, which were conducted on Blocks 3 and 8 of the Tolerance Development phase. Eight of the selected triads were assigned to participate on Block 3, and 9 triads were assigned to participate on Block 8. The selected triads were randomly assigned to undergo the CR test on 1 of the 2 sessions of the assigned block. On the appropriate CR day, each triad participating in this test was treated as usual, except that ethanol-free sweet solution was infused in place of the usual ethanol solutions.

US Only Test

Fifteen triads were randomly selected to participate in the US Only test, which took place one day after the final session of the Tolerance Development phase. On this day, the roles of SA-E and Y-E subjects were reversed. Subjects that had been yoked throughout the Tolerance Development phase were given the opportunity to self-administer ethanol by drinking sweet solution, and are referred to as YE-SAE subjects. Subjects that normally self-administered ethanol were yoked (SAE-YE). The amount of ethanol that could be administered by each YE-SAE subject was limited to the amount that had been administered by its SAE-YE partner on Block 10 of the Tolerance

Development phase. Except for the reversal of the roles of SA-E and Y-E subjects, the experimental protocol was otherwise similar to that of the Tolerance Development phase.

Results and Discussion

Data Management

Due to catheter problems, some subjects were unable to complete the experiment. These subjects and the other members of their triads were eliminated from the study. The experiment, then, was completed with 38 triads. The data from eliminated triads are not presented and were not included in any analyses.

Tolerance Development

Ethanol administration. The amount of ethanol delivered to SA-E and Y-E subjects was equated for volume. Differences in weights between subjects in these groups could have resulted, then, in differences in doses delivered. The mean dose of ethanol administered to the SA-E and Y-E groups across the 10 blocks of the Tolerance Development phase are presented in Figure 7. A mixed-design ANOVA of these data indicated that there was no difference approaching significance in the doses of ethanol administered to these groups. There was, however, a significant Block effect, $F(9,333)=4.64$, $p<.001$. Tukey HSD post hoc analyses indicated that the mean dose of ethanol administered on Block 1 was greater than that administered on all subsequent blocks (all $ps<.005$).

Insert Figure 7 about here

Although ethanol administration was equated for volume, there was no difference in the doses delivered to subjects in SA-E and Y-E groups. Any difference in impairment between these groups, then, cannot be attributed to differences in the doses of ethanol administered.

Pre-ethanol slip angles. Figure 8 depicts the mean pre-ethanol slip angles for each of the 3 groups across the 10 blocks.

Insert Figure 8 about here

A Group X Block mixed-design ANOVA of the data presented in Figure 8 indicated that there was no group effect ($p>.1$), but that there was a significant effect of block, $F(9,999)=19.58$, $p<.001$. Tukey HSD post hoc analyses of these data indicated that the pre-ethanol slip angles were lower on some of the later blocks (6, 8, 9, and 10) than earlier blocks (1-5, 7) (all $ps<.05$).

Ataxia. Mean impairment scores for the SA-E, Y-E and Y-C groups across the 10 blocks are presented in Figure 9. A repeated measures ANOVA of the data presented in Figure 9 indicated that there was a significant Group effect, $F(2,74)=134.68$, $p<.001$.

Tukey HSD post hoc analyses indicated that the impairment scores of each group differed from those of the other groups (all ps<.001).

Insert Figure 9 about here

There was also a significant Group X Block interaction, $F(18, 666)=3.05$, $p<.001$. Tukey HSD post hoc analyses indicated that on Block 1, the two ethanol groups did not differ from one another, but that both were significantly impaired, compared to group Y-C. However, on several blocks, beginning on Block 4 (also Blocks 5, 6, 7, and 9), the SA-E group was significantly less impaired than the Y-E group (all ps<.05). On Blocks 5 and 10, the impairment scores of the SA-E group were no different than those of the Y-C group (both ps>.05). On every block, the scores of the Y-E group were not equal to those of the Y-C group (all ps<.05).

Although they received the same doses of ethanol at the same times, subjects that self-administered ethanol were significantly less impaired by ethanol than were their yoked partners that passively received it. Both ethanol groups were equally impaired at the beginning of tolerance development, but self-administering subjects became tolerant to the ataxic effect of ethanol, such that after 3 blocks of ethanol administration sessions, they were less impaired than their partners that passively received ethanol.

CR Test

CR tests were conducted to determine whether SA-E and Y-E subjects had learned to associate ethanol-paired cues with the ataxic effect of ethanol. The expected CR was hypertaxia. Positive impairment scores are indicative of hypertaxia.

The impairment scores for this test were positive, indicating that the subjects were hypertaxic. A Group X Block mixed design ANOVA conducted on the CR data indicated that there was no effect of Block (p>.1). Therefore, the data were collapsed across blocks.

The mean impairment scores for the 3 groups, collapsed across the CR tests, are shown in Figure 10. A repeated measures ANOVA for the data presented in Figure 10 indicated that there was a significant difference between groups, $F(2,32)=19.23$, $p<.001$. Tukey HSD post hoc analyses indicated that each group differed from both other groups (all ps<.05).

Insert Figure 10 about here

Both ethanol groups demonstrated CRs, in the form of hypertaxia. However, the CRs demonstrated by the SA-E group were larger than those demonstrated by Y-E subjects. These results demonstrate that SA-E subjects had formed stronger associations between the ataxic effect of ethanol and ethanol-paired cues than had Y-E subjects. A stronger association would result in greater CRs and therefore greater tolerance. These results confirm the hypothesis, then, that the faster tolerance development of SA-E subjects in the Tolerance Development phase was associative.

US Only Test

This test was conducted to determine whether SA-E subjects associated cues incidental to self-administration with the effect of ethanol. Self-administering animals may have formed associations between the ataxic effect of ethanol and internal, salient, cues more quickly than Y-E subjects formed associations between the ataxic effect of ethanol and external, less salient, cues. If SA-E subjects do use internal cues to predict and prepare for the effect of ethanol, then the presentation of ethanol to SA-E subjects in the absence of the usual, internal, cues would result in a loss of tolerance to the ataxic effect of ethanol.

Ethanol administration. The amount of ethanol delivered to SAE-YE and YE-SAE subjects was equated for volume. Differences in weights between subjects in these groups could have resulted, then, in differences in doses delivered. Figure 11 depicts the mean dose of ethanol administered to both ethanol groups on both Block 10 of the Tolerance Development Phase and the Role Reversal Test. A Group X Test repeated measures ANOVA for the data presented in Figure 11 indicated that there was no difference approaching significance in the doses of ethanol administered to the groups on either of the 2 tests.

Insert Figure 11 about here

Ataxia. The mean impairment scores for both ethanol groups on Block 10 of the Tolerance Development Phase and the US Only Test are presented in Figure 12. A Group X Test repeated measures ANOVA for these data indicated that there was a significant interaction of Group and Test, $F(2,28)=10.75$, $p<.001$. Tukey HSD post hoc analyses indicated that group SAE-YE was more impaired on the US Only Test than on Block 10 ($p<.01$). However, for groups YE-SAE and Y-C, there were no changes approaching significance in impairment scores from Block 10 to the US Only Test.

Insert Figure 12 about here

Although they received the same dose of ethanol on both sessions, SAE-YE subjects were significantly more impaired when they received the ethanol in a yoked manner than when it was self-administered. When typical ethanol-paired cues were removed, subjects that normally self-administer ethanol lost the ability to predict and prepare for the effect of ethanol. Thus, these subjects demonstrated a loss of ethanol tolerance. These results suggest that some component of the self-administration process serves as a CS for self-administering subjects.

General Discussion

The results of the present experiments indicate that both heroin and ethanol induce less ataxia when they are self-administered than when they are passively received. In addition, rats develop tolerance to the ataxic effect of ethanol more quickly if they self-administer the drug (SA-E) than if they passively receive the same doses at the same times (Y-E). These findings are consistent with results of previous studies which have found that some effects of drugs were smaller when the drugs were self-administered than when they were passively received (e.g., Donny et al., 1995; Dworkin et al., 1995).

Experiment 3 demonstrated three properties of the differences in ethanol-induced ataxia between SA-E and Y-E animals. First, although both ethanol groups were ataxic on the first block of ethanol administration, SA-E rats developed tolerance to ethanol-induced ataxia, while Y-E rats did not. Secondly, tolerance to ethanol-induced ataxia was expressed by SA-E subjects only if the ethanol was self-administered. That is, tolerance which was acquired when ethanol was self-administered was not expressed when the drug was passively received. This finding corroborates the results of other studies which indicate that humans that normally self-administered opiates (Ehrman et al., 1992) and ethanol (Mello & Mendelson, 1970) were only tolerant to effects of the drugs when the drugs were self-administered, and not when they were passively received. Finally, SA-E and Y-E subjects demonstrated drug-opposite responses when presented with ethanol-paired cues in the absence of ethanol. However, SA-E subjects demonstrated larger drug opposite responses than did their Y-E partners.

Interpretation of the Differential Ataxia Induced by Self-Administered and Passively Received Drugs

It is clear that the effect of a drug depends on whether the drug is self-administered or passively received. However, the mechanism for the difference between these types of administration is not yet clear.

Self-administration as optimized drug delivery. One interpretation of the different effects of self-administered and passively received drugs is based on observations that self-administering and yoked subjects may experience different degrees of sensitivity to a drug (MacRae & Siegel, 1997). An animal may self-administer a drug at the time most optimal for itself, such as when the animal is experiencing withdrawal or when the drug will be reinforcing. However, because animals differ in their pharmacodynamic and pharmacokinetic responses to drugs, the timing of drug administrations by a self-administering rat may not be optimal for its yoked partner, which has no control over drug administrations.

The differential optimization hypothesis may account for different neurochemical effects in animals that self-administer the drug than in those that passively receive the drug (e.g., Baptista et al., in preparation; Smith et al., 1980; Smith et al., 1982; Smith et al., 1984a, 1984b; Wilson et al., 1994). This theory can also account for the development of tolerance by SA-E subjects and for the loss of tolerance demonstrated by SA-E subjects when they passively receive ethanol (Experiment 3). However, it is unclear how differential optimization can account for the larger drug-opposite responses demonstrated by SA-E subjects than by Y-E subjects during the CR Test in Experiment 3. Similarly, it is unclear how differential optimization can account for the greater frequency of morphine- (MacRae & Siegel, 1997) and ethanol- (Mello & Mendelson, 1970) withdrawal symptoms demonstrated by rats that had self-administered the drug than by rats that had passively received it.

Controllability of stress affects drug-induced ataxia. For many years it has been recognized that stress, induced by events such as restraint and shock, has behavioral (e.g., Short & Maier, 1993) and physiological (e.g., Drugan et al., 1989) effects on an animal. It also has been demonstrated that stress may alter the effects of drugs. For example, stress, induced by restraint and FG 7142, a benzodiazepine (BDZ) receptor inverse agonist, potentiates ethanol-induced ataxia (Austin, Myles, Brown, Mammola, & Drugan, 1999). Of particular importance to the present study is the finding that the controllability of stress may play a role in how the stress affects an animal (Drugan, Coyle, Healy, and Chen, 1996). Escapable shock administered prior to ethanol attenuated ethanol-induced ataxia in rats, while uncontrollable shock administered prior to ethanol potentiated ethanol-induced ataxia (Drugan et al., 1996). Shock in the absence of ethanol did not affect performance on the ataxia test (Drugan et al., 1996).

There is evidence that stress may have its modulatory effect on ethanol-induced ataxia via the gamma-aminobutyric acid/BDZ (GABA/BDZ) receptor complex. GABA has been demonstrated to have an inhibitory effect on several other receptors, including N-methyl-D-aspartate (NMDA) and serotonin (5-HT) receptors (Austin et al., 1999).

Modulation of the GABA/BDZ receptor complex can alter ethanol-induced motor impairment (Austin et al., 1999). Moreover, modulation of the GABA/BDZ receptor complex has been demonstrated following uncontrollable, but not controllable, stress (e.g., Drugan et al., 1989; Drugan, Paul, & Crawley, 1993).

Some aspects of the drug administration sessions in the present study may have been stressful to the subjects, although it seems unlikely that the pharmacological effects of the ethanol would have been stressful. Ethanol appears, in fact, to decrease anxiety in rats. This has been demonstrated, for example, by findings that ethanol restores stress-induced changes in locomotor behaviour (Trudeau, Aragon, & Amit, 1990). Evidence that ethanol reverses stress-induced changes in brain monoamine levels (Kuriyama, Kanmori, & Yoneda, 1984) and attenuates stress-induced increases in dopamine (DA) levels in the rat frontal cortex (Hegarty & Vogel, 1993) also suggest that ethanol is stress reducing. Moreover, subjects in the SA-E group of Experiment 3 of the present study did not change the dose of ethanol administered after the first block of administration sessions, indicating that they did not find ethanol aversive.

The possibility remains that some component of the drug administration, other than the effect of the ethanol, was stressful to the subjects. For example, some sensation inherent to intragastric administration of ethanol may be stressful to rats. If this is the case, then in the present study, administration-related stress would have been controlled for self-administering subjects, but not for their yoked partners. Thus, the differences in ataxia demonstrated by SA-E and Y-E subjects in the present study may have been due to differences in the way that controllable and uncontrollable stress interacted with the GABA/BDZ receptor complex to modulate ethanol-induced ataxia. As SA-E subjects learned that they had control over the stress, the stress would have increasingly attenuated the ethanol-induced ataxia, and these subjects would have developed tolerance. This process would not have occurred for Y-E subjects, which did not develop tolerance to the ataxic effect of ethanol. Thus, the differential control of stress provides a mechanism by which the decreasing ataxic effect of ethanol occurs in SA-E, but not Y-E, subjects. Moreover, when SA-E subjects were given ethanol outside of their own control (US Only test), the stress was not controllable. Thus, the uncontrollable stress would have potentiated the ethanol-induced ataxia, and the subjects would then have experienced greater ataxia than they had on previous sessions when they controlled ethanol-administration. This theory, then, also accounts for the loss of tolerance when SA-E subjects passively received ethanol. However, it is unclear how differential control of stress could have affected the results of the CR Test, in which no drug is administered.

Further testing is necessary to confirm or dismiss controllability of stress as the mechanism by which self-administered ethanol is less ataxic than passively received ethanol, and by which subjects that self-administer ethanol develop tolerance to its ataxic effect while their yoked partners do not. Studies conducted with the purpose of determining whether stress controllability plays a role in the differential effects of self-administered and passively received drugs must first ascertain whether ethanol administration does indeed cause stress. One means of determining whether a rat experiences stress may be to measure levels of the DA metabolite 3,4-dihydroxyphenylacetic acid (DOPAC) in the prefrontal cortex. Various stressors, including footshock (Fadda, Mosca, Niffoi, Colombo, & Gessa, 1987; Lavielle et al., 1979; Reinhard, Bannon, & Roth, 1982), immobilization (Matsuguchi, Ida, Shirao, & Tsujimaru, 1994), FG 7142 (Ida & Roth, 1987; Tam & Roth, 1985), and conditional stimuli previously paired with footshock (Ida, Tsuda, Sueyoshi, Shirao, & Tanaka, 1989) have been found to alter DA metabolism, ultimately increasing levels of DOPAC in the prefrontal cortex. Ethanol, whether administered orally (Fadda et al., 1987) or intraperitoneally (Matsuguchi et al., 1994), as well as benzodiazepines such as diazepam (Ida & Roth, 1987; Ida et al., 1989; Lavielle et al. 1979; Reinhard et al., 1982) have been found to block stress-induced increases in DOPAC in the prefrontal cortex. However, the stress-blocking effects of ethanol and diazepam have been reversed by BDZ receptor antagonists Ro 15-4513 (Fadda et al., 1987) and Ro 15-1788 (Ida et al., 1989), respectively. Thus, by administering Ro 15-4513 to rats also treated with ethanol, any stress-induced increased in prefrontal DOPAC levels can be measured.

To determine whether the experimental protocol used in Experiment 3 induced stress, one might conduct a study similar to Experiment 3 with the addition of administering Ro 15-4513 following the administration session and measuring DOPAC levels in the prefrontal cortex via microdialysis. If rats subjected to an experimental procedure similar to that used in Experiment 3 do experience stress in conjunction with ethanol administrations, the ethanol would block stress-induced increases in prefrontal

DOPAC levels. However, by administering Ro 15-4513, the blocking effect of ethanol would be reversed, and any stress-induced alterations in DOPAC levels would be evident. If DOPAC levels are elevated in SA-E or Y-E subjects compared to baseline levels or DOPAC levels of Y-C subjects, then it is likely that the animals do experience some stress. However, no change in DOPAC levels would indicate that the animals do not experience stress. This procedure would also allow one to determine whether SA-E and Y-E subjects experience different levels of administration-induced stress, and therefore whether controllability of stress played any part in the differential ataxic effect of self-administered and passively received ethanol.

Pavlovian conditioning interpretation. "There is no longer any question about the importance of associative factors in drug tolerance" (Poulos & Cappell 1991, p.391). It has been well established that the association of a drug effect (US) with the cues (CSs) that are typically paired with the drug effect may result in conditional responses which counter the drug effect and result in tolerance. Drug tolerance has been found to develop more quickly when drug administrations are preceded by a reliable cue than when the cue changes (e.g., Epstein, Cagguila, Perkins, McKenzie, & Smith, 1991) or is absent (e.g., Siegel, Hinson, & Krank, 1978). Demonstrations that tolerance is more pronounced in the presence of cues previously paired with the drug (situational-specificity of tolerance) provide support for the Pavlovian conditioning analysis of drug tolerance (e.g., Lê, Poulos, & Cappell, 1979; Siegel, 1989, 1991). Further support for a Pavlovian conditioning analysis of drug tolerance is provided by findings that phenomena such as external inhibition (e.g., Siegel & Larson, 1996), latent inhibition (e.g., Tiffany & Baker, 1981), and overshadowing (e.g., Walter & Riccio, 1983), which affect other conditioning situations, also affect tolerance.

In a typical drug conditioning experiment, a cue such as a tone or light is systematically paired with each administration of a drug. It is expected that the subject will learn to associate the cue (CS) with the drug effect (US). However, there have been suggestions that "unauthorized" cues may overshadow experimenter-manipulated environmental cues and come to serve as CSs (e.g., Greeley, Lê, Poulos, & Cappell, 1984; Grisel, Wiertelak, Watkins, & Maier, 1994; Walter & Riccio, 1983). For example, under some circumstances, interoceptive cues, in the form of the early effect of a drug, may overshadow environmental cues and come to serve as CSs for the later drug effect (Kim, Siegel, & Patenall, in press).

It has been demonstrated that cues inherent to the process of self-administration may serve as CSs for animals that self-administer a drug (e.g., Ehrman et al., 1992; MacRae & Siegel, 1997). These cues may be internal, proprioceptive, or in some other way related to the process of self-administration. For example, in the case of oral ethanol administrations, the flavour of the ethanol solution may serve as a CS. Recently, MacRae and Siegel (1997) suggested that, because they may be perfectly paired with the drug effect and may be particularly salient, self-administration cues may overshadow experimenter-manipulated, external cues and come to serve as CSs for animals that self-administer a drug. Thus, animals that self-administer a drug may form an association between these very salient self-administration cues and the drug effect more rapidly than animals that passively receive the drug learn to associate experimenter-manipulated cues with the drug effect. Self-administering animals, then, may become tolerant to the drug effect more rapidly than animals that passively receive the drug.

Experiment 3 provides support for the associative interpretation of the differences between self-administered and passively received ethanol. The CR Test indicated that a hypertaxic response was conditioned for both SA-E and Y-E subjects, indicating that subjects in both groups had learned to associate some cue with the ataxic effect of ethanol. However, SA-E subjects exhibited larger CRs than did Y-E subjects. According to a Pavlovian conditioning interpretation, larger CRs would have resulted in the enhanced tolerance demonstrated by SA-E subjects.

Cues inherent to ethanol self-administration were available to SA-E subjects, while Y-E subjects could only rely on cues which may have been less salient and less perfectly correlated with the drug effect, as predictors of ethanol administrations. The US Only test confirmed that cues related to the self-administration process served as CSs for SA-E subjects. When SA-E subjects were given ethanol in a non-contingent manner they no longer demonstrated tolerance to the ataxic effect of ethanol. Thus, for SA-E rats, expression of tolerance was specific to self-administered ethanol -- that is, SA-E subjects demonstrated a loss of tolerance to the ataxic effect of ethanol if the ethanol was administered outside of their own control. These results indicate, then, that some component or components of the self-administration process serve as a CS for subjects that self-administer ethanol.

In summary, the Pavlovian conditioning interpretation argues that the formation of associations between administration-related cues and the effect of ethanol (SA-E subjects) develops more rapidly than the association between non-administration cues and the effect of ethanol (Y-E subjects), therefore resulting in faster development of CRs and therefore of tolerance in SA-E, than in Y-E, subjects. Moreover, because self-administration cues serve as CSs, the tolerance acquired by SA-E subjects is specific to self-administered ethanol. Thus, unlike the other two possible mechanisms described, the Pavlovian conditioning interpretation can account for the three properties of the differences in ethanol-induced ataxia between SA-E and Y-E animals demonstrated in Experiment 3: That SA-E subjects developed tolerance to ethanol-induced ataxia while Y-E subjects did not, that tolerance which was acquired when ethanol was self-administered was not expressed when ethanol was passively received, and that the drug-opposite responses of SA-E subjects presented with ethanol-paired cues in the absence of ethanol were greater than those of Y-E subjects.

Summary and Implications

Most experiments designed to contribute to the understanding of drug tolerance and withdrawal have studied passively received drugs. There is evidence, however, in the experiments presented here and in experiments conducted by others (e.g., Dworkin et al., 1995; MacRae & Siegel, 1997; Moolten & Kornetsky, 1990) that the effects of many drugs differ, and that tolerance and withdrawal may develop differently, depending on whether or not their administration is contingent upon a response. Models of drug tolerance and withdrawal which are based on studies using passive administration of drugs, then, may require modification if they are to be applied to self-administration situations, such as human drug abuse.

References

Arvola, A., Sammalisto, L., & Wallgren, H. (1958). A test for level of alcohol intoxication in the rat. Quarterly Journal of Studies on Alcohol, 19, 563-572.

Austin, M., Myles, V., Brown, P. L., Mammola, B., & Drugan, R. C. (1999). FG 7142- and restraint-induced alterations in the ataxic effects of alcohol and midazolam in rats are time dependent. Pharmacology Biochemistry and Behavior, 62, 45-51.

Ator, N. A., & Griffiths, R. R. (1993). Differential sensitivity to midazolam discriminative-stimulus effects following self-administered versus response-independent midazolam. Psychopharmacology, 110, 1-4.

Baptista, M., Weise-Kelly, L., MacQueen, G., Young, T., & Siegel, S. (in preparation). c-Fos levels are differentially expressed in rats that self-administer heroin and those that passively receive the drug.

Cox, J. E. (1990). Inhibitory effects of cholecystokinin develop through interaction with duodenal signals. Behavioural Brain Research, 38, 35-44.

Donny, E. C., Cagguila, A. R., Knopf, S., & Brown, C. (1995). Nicotine self-administration in rats. Psychopharmacology, 122, 390-394.

Drugan, R. C., Coyle, T. S., Healy, D. J., & Chen, S. (1996). Stress controllability influences the ataxic properties of both ethanol and midazolam in the rat. Behavioral Neuroscience, 110, 360-367.

Drugan, R. C., Morrow, A. L., Weizman, R., Weizman, A., Deutsch, S. I., Crawley, J. N., & Paul, S. M. (1989). Stress-induced behavioral depression in the rat is associated with a decrease in GABA receptor-mediated chloride ion flux and brain benzodiazepine receptor occupancy. Brain Research, 487, 45-51.

Drugan, R. C., Paul, S. M., & Crawley, J. N. (1993). Decreased forebrain [^{35}S]TBPS binding and increased [^{3}H]muscimol binding in rats that do not develop stress-induced behavioral depression. Brain Research, 631, 270-276.

Dworkin, S. I., Mirkis, S., & Smith, J. E. (1995). Response-dependent versus response-independent presentation of cocaine: Differences in the lethal effects of the drug. Psychopharmacology, 117, 262-266.

Ehrman, R., Ternes, J., O'Brien, C. P., & McLellan, A. T. (1992). Conditioned tolerance in human opiate addicts. Psychopharmacology, 108, 218-224.

Eickholt, T. H., Schillaci, L. J., & Searcy, S. A. (1967). Possible ethanol-induced tolerance in rats. Journal of Pharmaceutical Sciences, 56, 275-277.

Epstein, L. H., Cagguila, A. R., Perkins, K. A., McKenzie, S., & Smith, J. A. (1991). Conditioned tolerance to the heart rate effect of smoking. Pharmacology Biochemistry and Behavior, 39, 15-19.

Fadda, F., Mosca, E., Niffoi, T., Colombo, G., & Gessa, G. L. (1987). Ethanol prevents stress-induced increase in cortical DOPAC: Reversal by RO 15-4513. Physiology & Behavior, 40, 383-385.

Greeley, J. Lê, D. A., Poulos, C. X., & Cappell, H. (1984). Alcohol is an effective cue in the conditional control of tolerance to alcohol. Psychopharmacology, 83, 159-162.

Grisel, J. E., Wiertelak, E. P., Watkins, L. R., & Maier, S. F. (1994). Route of morphine administration modulates conditioned analgesic tolerance and hyperalgesia. Pharmacology Biochemistry and Behavior, 49, 1029-1035.

Hegarty, A. A., & Vogel, W. H. (1993). Modulation of the stress response by ethanol in the rat frontal cortex. Pharmacology Biochemistry and Behavior, 45, 327-334.

Ida, Y., & Roth, R. H. (1987). The activation of mesoprefrontal dopamine neurons by FG 7142 is absent in rats treated chronically with diazepam. European Journal of Pharmacology, 137, 185-190.

Ida, Y., Tsuda, A., Sueyoshi, K., Shirao, I., & Tanaka, M. (1989). Blockade by diazepam of conditioned fear-induced activation of rat mesoprefrontal dopamine neurons. Pharmacology Biochemistry & Behavior, 33, 477-479.

Johanson, C. E., & Schuster, C. R. (1981). Animal models of drug self-administration. In N. Mello (Ed.), Advances in substance abuse (vol. 2, pp. 219-227). Greenwich, CT: JAI Press.

Kim, J. A., Siegel, S., & Patenall, V. R. A. (in press). Drug-onset cues as signals: Intra-administration associations and tolerance. Journal of Experimental Psychology: Animal Behavior Processes.

Kissin, I., Brown, P. T., Robinson, C. A., & Bradley, E. L. Jr. (1991). Acute tolerance to the hypnotic effect of morphine in rats. Anesthesia and Analgesia, 73, 619-621.

Kissin, I., Kerr, C. R., & Smith, L. R. (1983). Assessment of anaesthetic action of morphine and fentanyl in rats. Journal of the Canadian Anaesthesiology Society, 30, 623-628.

Kiyatkin, E. A., & Stein, E. A. (1995). Fluctuations in nucleus accumbens dopamine during cocaine self-administration behavior: An in vivo electrochemical study. Neuroscience, 64, 599-617.

Krank, M. D., Hinson, R. E., & Siegel, S. (1981). Conditional hyperalgesia is elicited by environmental signals of morphine. Behavioral and Neural Biology, 32, 148-157.

Kuriyama, K., Kanmori, K., & Yoneda, Y. (1984). Preventive effects of alcohol on stress-induced alteration in content of monoamines in brain and adrenal gland. Neuropharmacology, 23, 649-654.

Larson, S. J., & Siegel. (1998). Learning and tolerance to the ataxic effect of ethanol. Pharmacology Biochemistry and Behavior, 61, 131-142.

Lavielle, S., Tassin, J. P., Thierry, A. M., Blanc, G., Herve, D., Barthelemy, C., & Glowinski, J. (1978). Blockade by benzodiazepines of the selective high increase in dopamine turnover induced by stress in mesocortical dopaminergic neurons of the rat. Brain Research, 168, 585-594.

Lê, A. D., Poulos, C. X., & Cappell, H. (1979). Conditioned tolerance to the hypothermia effect of ethyl alcohol. Science, 206, 1109-1110.

MacRae, J., & Siegel, S. (1997). The role of self administration in morphine withdrawal in rats. Psychobiology, 25, 77-82.

Matsuguchi, N., Ida, Y., Shirao, I., & Tsujimaru, S. (1994). Blocking effects of ethanol on stress-induced activation of rat mesoprefrontal dopamine neurons. Pharmacology Biochemistry and Behavior, 48, 297-299.

Mello, N. K., & Mendelson, J. H. (1970). Experimentally induced intoxication in alcoholics: A comparison between programmed and spontaneous drinking. Journal of Pharmacology and Experimental Therapeutics, 173, 101-116.

Moolten, M., & Kornetsky, C. (1990). Oral self-administration of ethanol and not experimenter-administered ethanol facilitates rewarding electrical brain stimulation. Alcohol, 7, 221-225.

Poulos, C. X., & Cappell, H. (1991). Homeostatic theory of drug tolerance: A general model of physiological adaptations. Psychological Review, 98, 390-408.

Ramsay, D. S., & Woods, S. C. (1997). Biological consequences of drug administration: Implications for acute and chronic tolerance. Psychological Review, 104, 170-193.

Reinhard, J. F., Bannon, M. J., & Roth, R. H. (1982). Acceleration by stress of dopamine synthesis and metabolism in prefrontal cortex: Antagonism by diazepam. Naunyn-Schmiedeberg's Archives of Pharmacology, 318, 374-377.

Sclafani, A., & Nissenbaum, J. W. (1985). On the role of the mouth and gut in the control of saccharin and sugar intake: a reexamination of the sham-feeding preparation. Brain Research Bulletin, 14, 569-576.

Short, K. R., & Maier, S. F. (1993). Stress controllability, social interaction and benzodiazepine systems. Pharmacology Biochemistry and Behavior, 45, 827-835.

Siegel, S. (1975). Evidence from rats that morphine tolerance is a learned response. Journal of Comparative and Physiological Psychology 89, 498-506.

Siegel, S. (1976). Morphine analgesic tolerance: Its situation specificity supports a

Pavlovian conditioning model? Science, 193, 323-325.

Siegel, S. (1989). Pharmacological conditioning and drug effects. In A. J. Goudie & M. W. Emmett-Oglesby (Eds.), Psychoactive drugs: Tolerance and sensitization (pp. 115-180). Clifton, NJ: Human Press.

Siegel, S. (1991). Feedforward processes in drug tolerance. In R. G. Lister & H. J. Weingartner (Eds.), Perspectives in cognitive neuroscience (pp. 405-416). New York: Oxford University Press.

Siegel, S., Hinson, R. W., & Krank, M. D. (1978). The role of predrug signals in morphine analgesic tolerance: Support for a Pavlovian conditioning model of tolerance. Journal of Experimental Psychology: Animal Behavior Processes, 4, 188-196.

Siegel, S., & Larson, S. J. (1996). Disruption of tolerance to the ataxic effect of ethanol by an extraneous stimulus. Pharmacology Biochemistry and Behavior, 55, 125-130.

Smith, J. E., Co, C., Freeman, M. E., & Lane, J. D. (1982). Brain neurotransmitter turnover correlated with morphine-seeking behavior in rats. Pharmacology Biochemistry & Behavior, 16, 509-519.

Smith, J. E., Co, C., Freeman, M. E., Sands, M. P., & Lane, J. D. (1980). Neurotransmitter turnover in rat striatum is correlated with morphine self-administration. Nature, 287, 152-154.

Smith, J. E., Co, C., & Lane, J. D. (1984a). Limbic acetylcholine turnover rates correlated with rat morphine-seeking behaviors. Pharmacology Biochemistry & Behavior, 20, 429-442.

Smith, J. E., Co, C., & Lane, J. D. (1984b). Limbic muscarinic cholinergic and benzodiazepine receptor changes with chronic intravenous morphine and self-administration. Pharmacology Biochemistry & Behavior, 20, 443-450.

Tam, S. Y., & Roth, R. H. (1985). Selective increase in dopamine metabolism in the prefrontal cortex by the anxiogenic beta-carboline FG 7142. Biochemical Pharmacology, 34, 1595-1598.

Tiffany, S. T., & Baker, T. B. (1981). Morphine tolerance in the rat: Congruence with a Pavlovian paradigm. Journal of Comparative and Physiological Psychology, 95, 747-762.

Trudeau, L. E., Aragon, C. M. G., & Amit, Z. (1990). Effects of ethanol on locomotor depression and corticosterone release induced by restraint-stress: Support for a stress-ethanol interaction. Pharmacology Biochemistry and Behavior, 36, 273-278.

Vaupel, D. B., McCoun, D., & Cone, E. J. (1984). Phencyclidine analogs and precursors: Rotarod and lethal dose studies in the mouse. The Journal of Pharmacology and Experimental Therapeutics, 230, 20-27.

Walter, T. A., & Riccio, D. C. (1983). Overshadowing effects in stimulus control of morphine analgesic tolerance. Behavioral Neuroscience, 97, 658-662.

Wilson, J. M., Nobrega, J. N., Corrigall, W. A., Coen, K. M., Shannak, K., & Kish, S. J. (1994). Amygdala dopamine levels are markedly elevated after self- but not passive-administration of cocaine. Brain Research, 668, 39-45.

Wise, R. A., Newton, P., Leeb, K., Burnette, B., Pocock, D., & Justice, J. B., Jr. (1995).

Fluctuations in nucleus accumbens dopamine concentration during intravenous cocaine self-administration in rats. Psychopharmacology, 120, 10-20.

Yang, P. K., Weinger, M. B., & Negus, S. S. (1992). Elucidation of dose-effect relationships for different opiate effects using alfentanil in the spontaneously ventilating rat. Anesthesiology, 77, 153-161.

Figure Captions

Figure 1. Mean dose of heroin administered (± 1 SEM) (mg/kg) to SA-H and Y-H subjects over 4 2-session blocks (Experiment 1).

Figure 2. Mean pre-administration slip angles (± 1 SEM) for SA-H, Y-H, and Y-C subjects over 4 2-session blocks (Experiment 1).

Figure 3. Mean impairment scores (± 1 SEM) for SA-H, Y-H, and Y-C subjects over 4 2-session blocks (Experiment 1).

Figure 4. Mean dose of ethanol administered (± 1 SEM) (g/kg) to SA-E and Y-E subjects over 10 2-session blocks (Experiment 2).

Figure 5. Mean pre-administration slip angles (± 1 SEM) for SA-E, Y-E, and Y-C subjects over 10 2-session blocks (Experiment 2).

Figure 6. Mean impairment scores (± 1 SEM) for SA-E, Y-E, and Y-C subjects over 10 2-session blocks (Experiment 2).

Figure 7. Mean dose of ethanol administered (± 1 SEM) (g/kg) to SA-E and Y-E subjects over 10 2-session blocks (Experiment 3).

Figure 8. Mean pre-ethanol slip angles (± 1 SEM) for SA-E, Y-E, and Y-C subjects over 10 2-session blocks (Experiment 3).

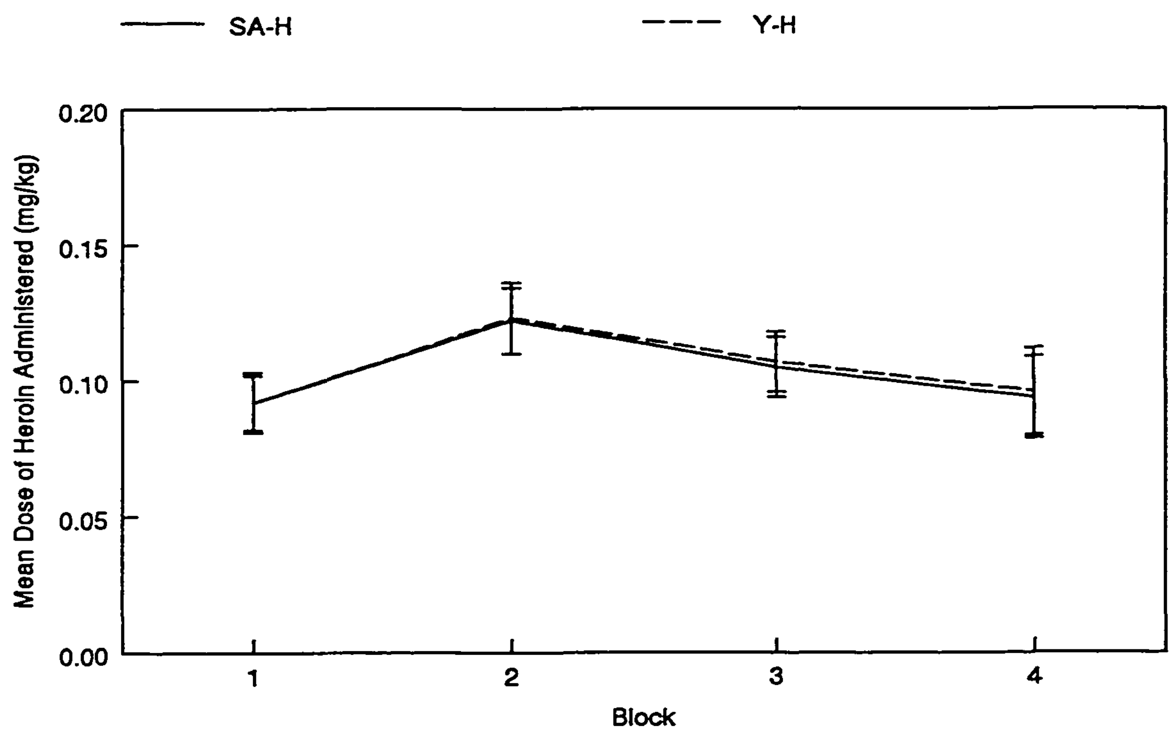
Figure 9. Mean impairment scores (± 1 SEM) for SA-E, Y-E, and Y-C subjects over 10 2-session blocks (Experiment 3).

Figure 10. Mean impairment scores (± 1 SEM) for SA-E, Y-E, and Y-C subjects on Conditional Response Test. Subjects in all groups received ethanol-free solution (Experiment 3).

Figure 11. Mean doses of ethanol administered (± 1 SEM) (g/kg) to SAE-YE and YE-SAE subjects on Block 10 and US Only Test (Experiment 3).

Figure 12. Mean impairment score (± 1 SEM) for SAE-YE, YE-SAE, and Y-C subjects on Block 10 and US Only Test (Experiment 3).

Figure 1.



SA-H
Y-H
Mean Dose of Heroin Administered (mg/kg)
0.00
0.05
0.10
0.15
0.20
1
2
3
4
Block

Figure 2.

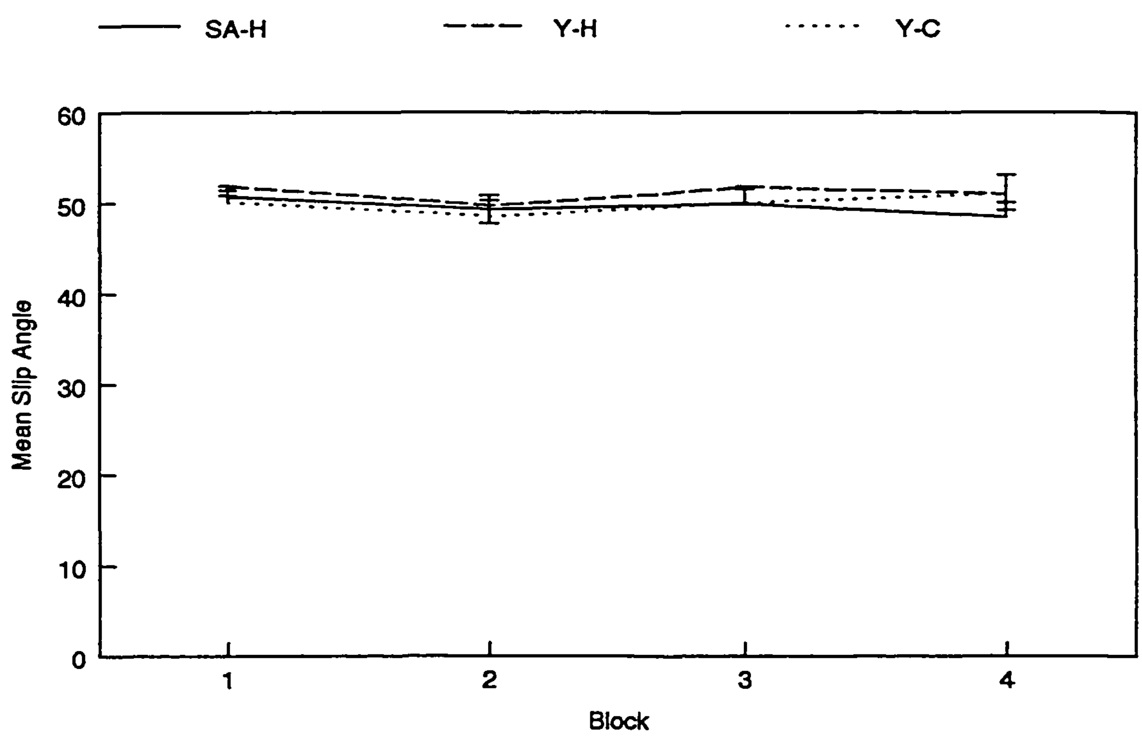


Figure 3.

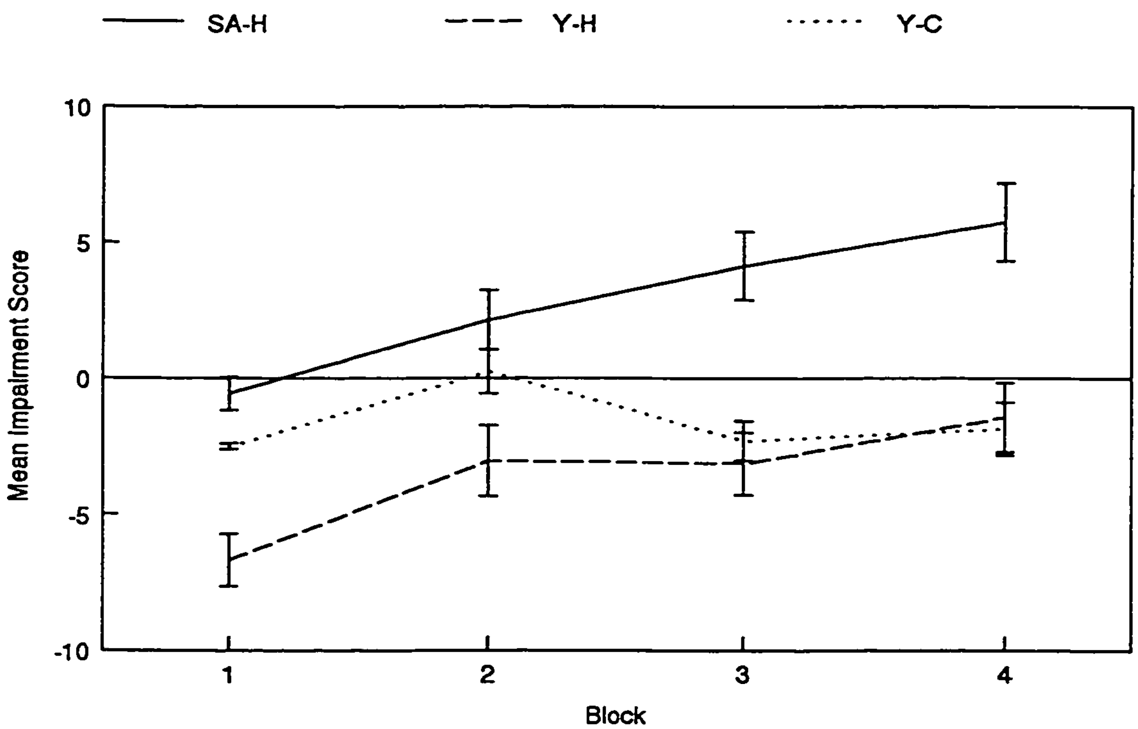


Figure 4.

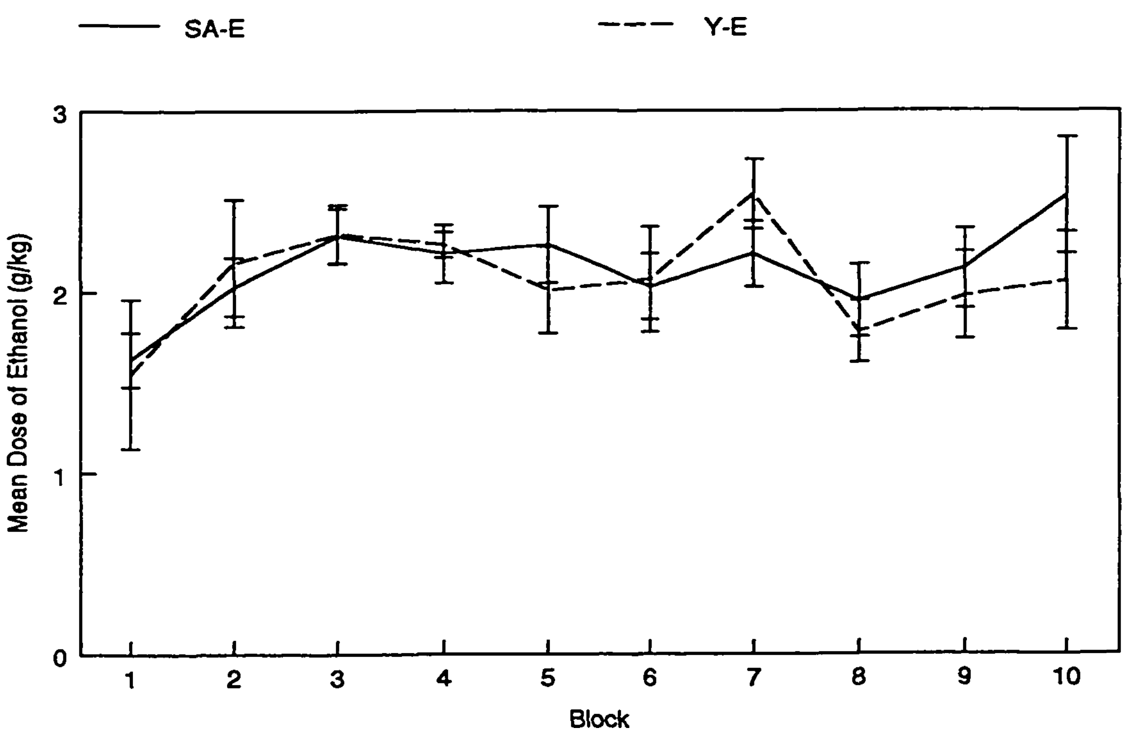


Figure 5.

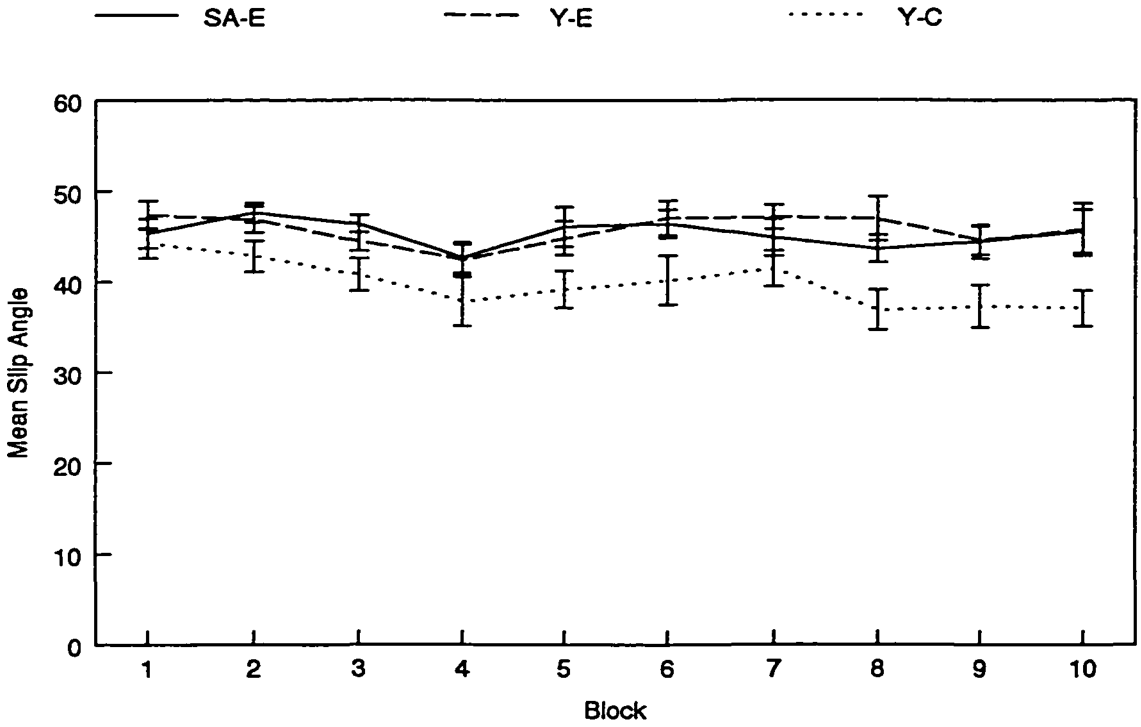


Figure 6.

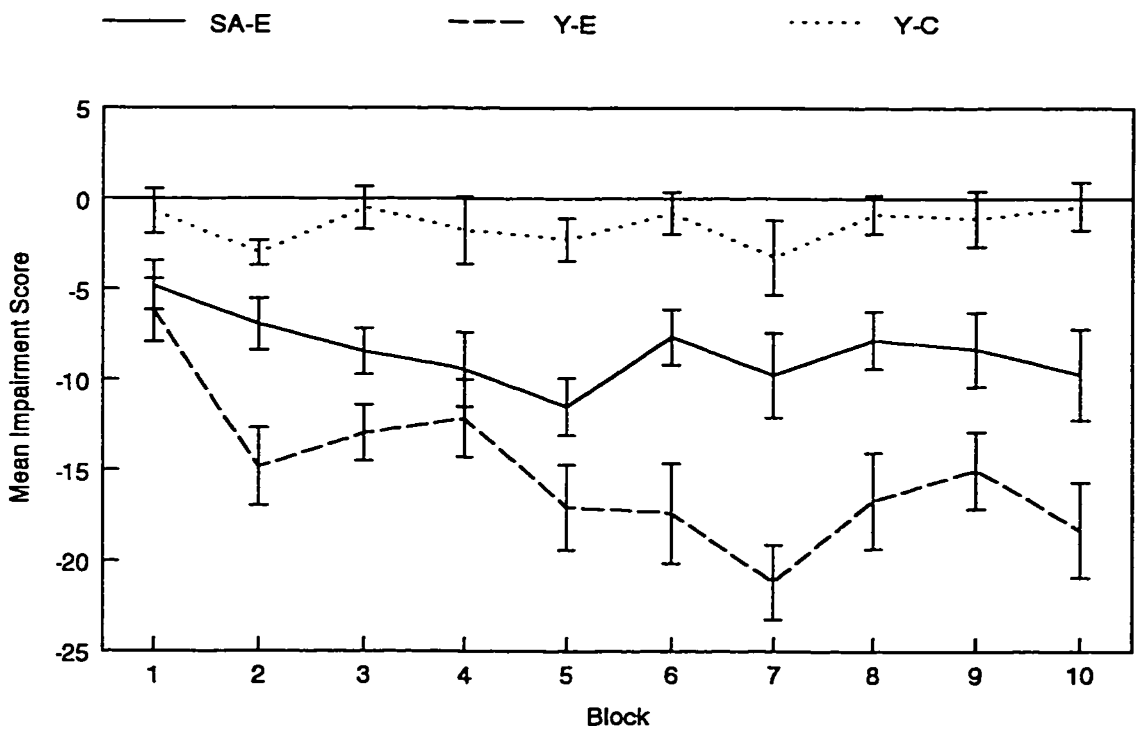

SA-E
Y-E
Y-C
5
0
-5
-10
-15
-20
-25
Mean Impairment Score
1
2
3
4
5
6
7
8
9
10
Block

Figure 7.

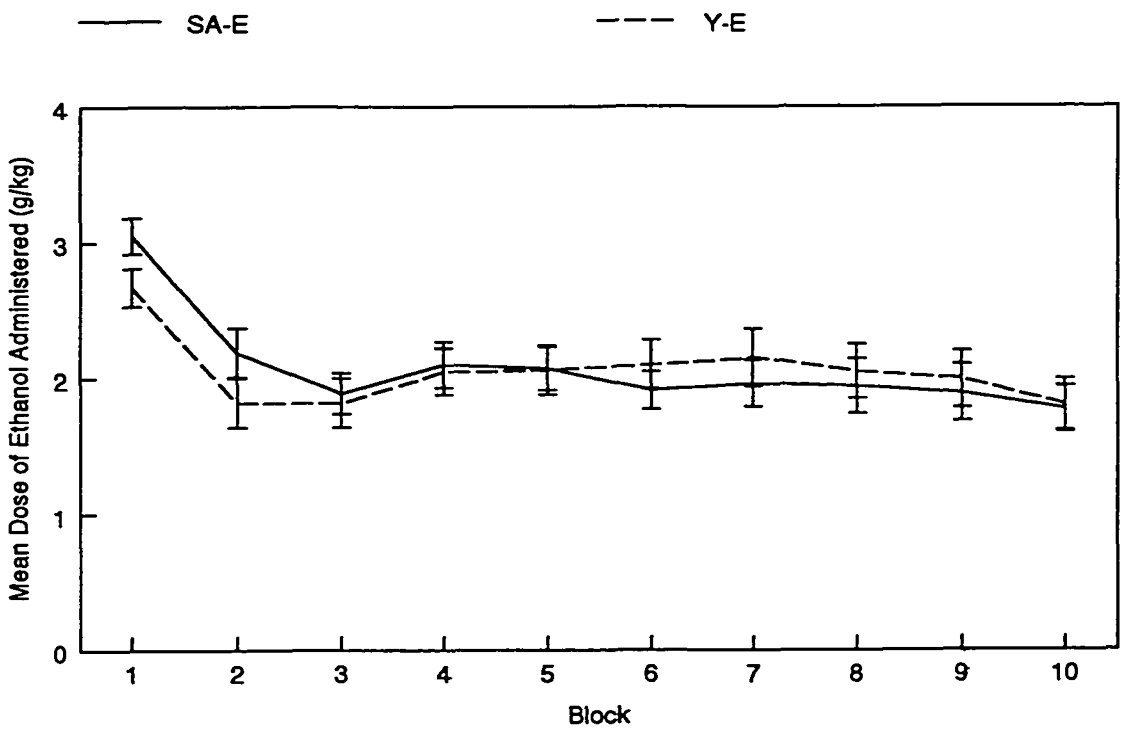

SA-E
Y-E
Mean Dose of Ethanol Administered (g/kg)
0
1
2
3
4
1
2
3
4
5
6
7
8
9
10
Block

Figure 8.

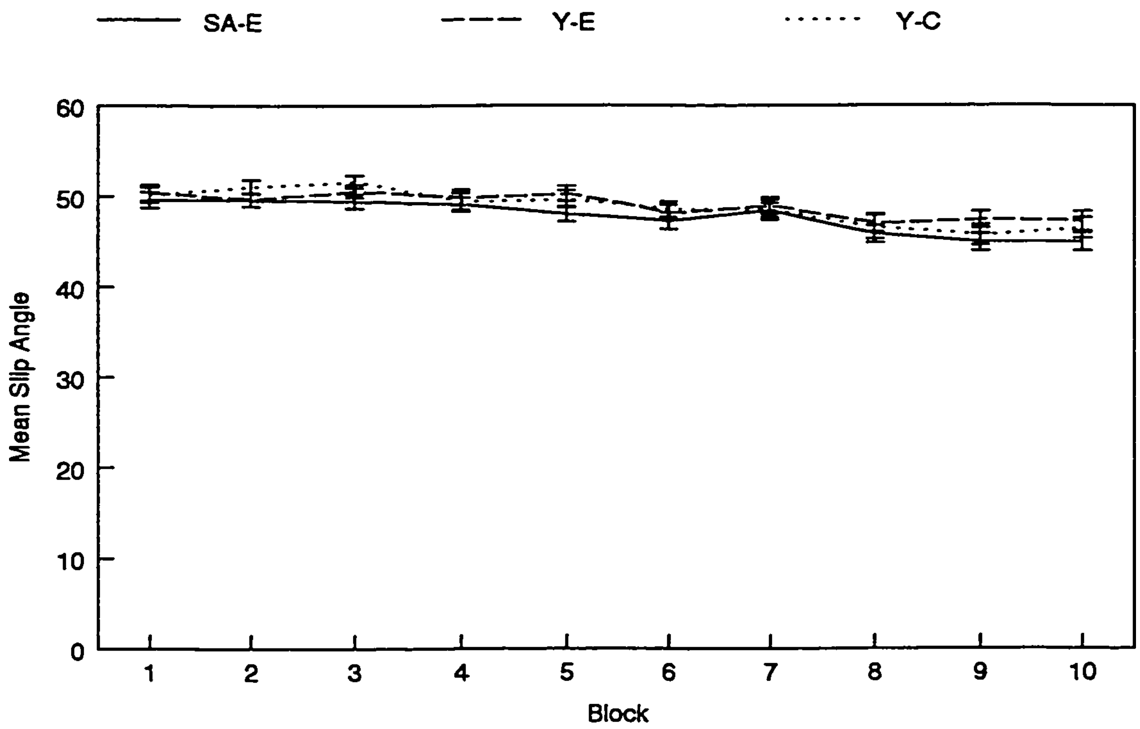


Figure 9.

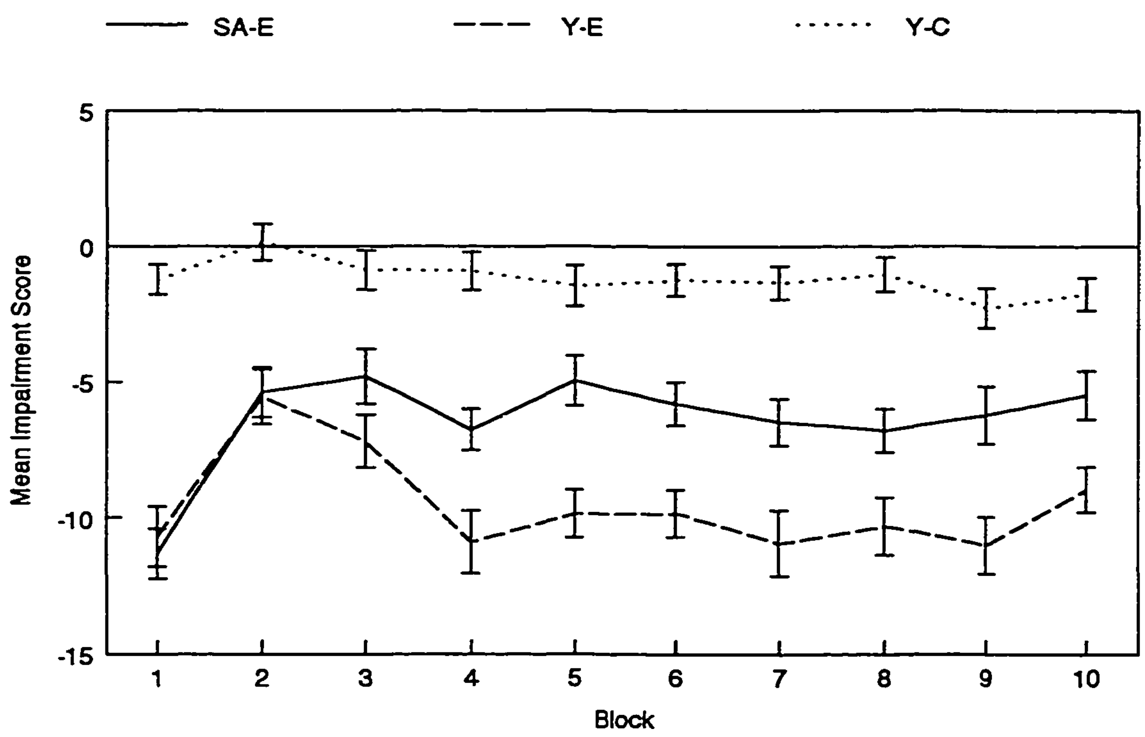


Figure 10.

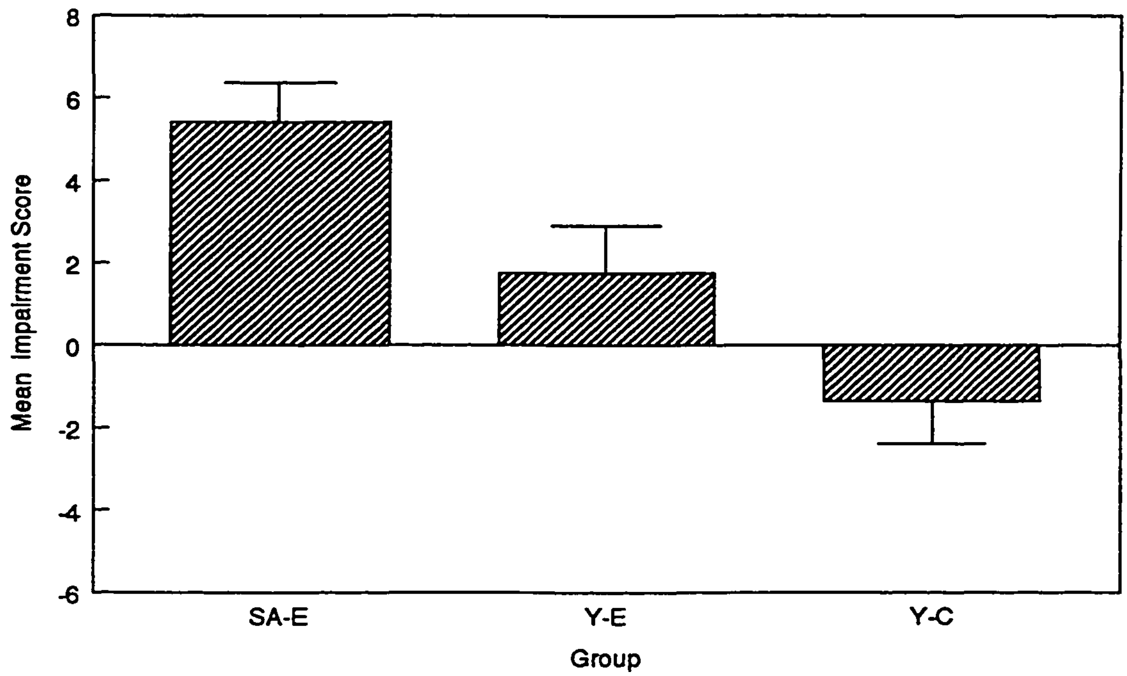


Figure 11.

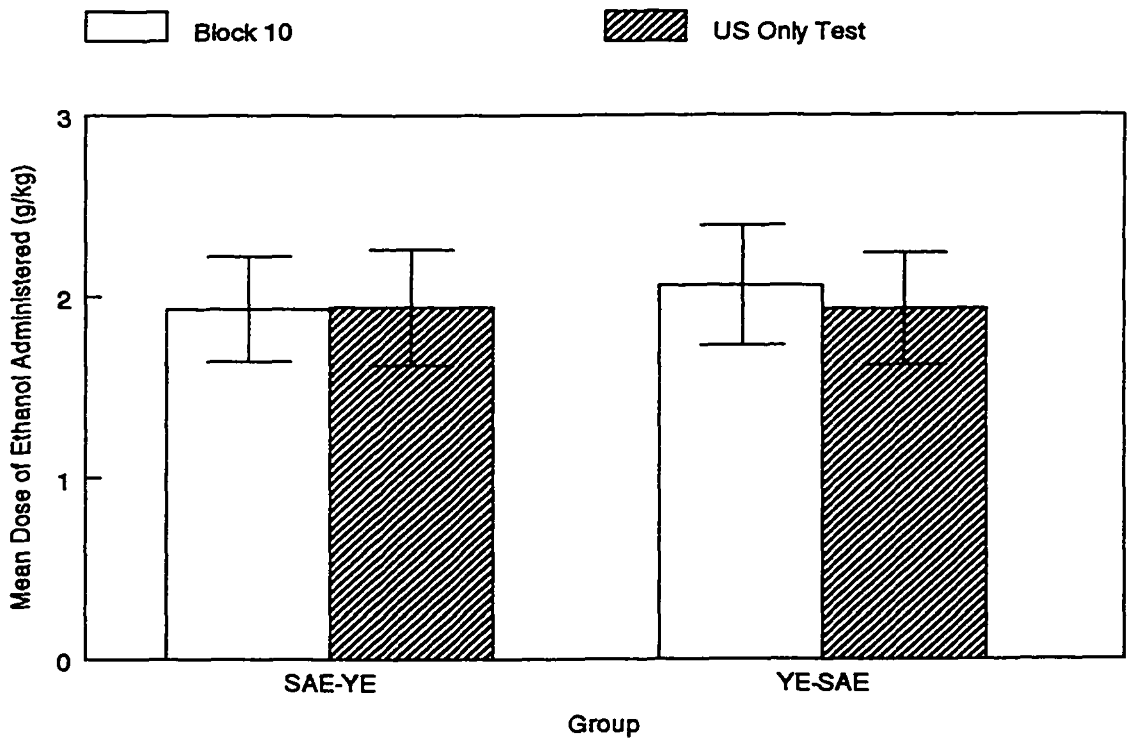
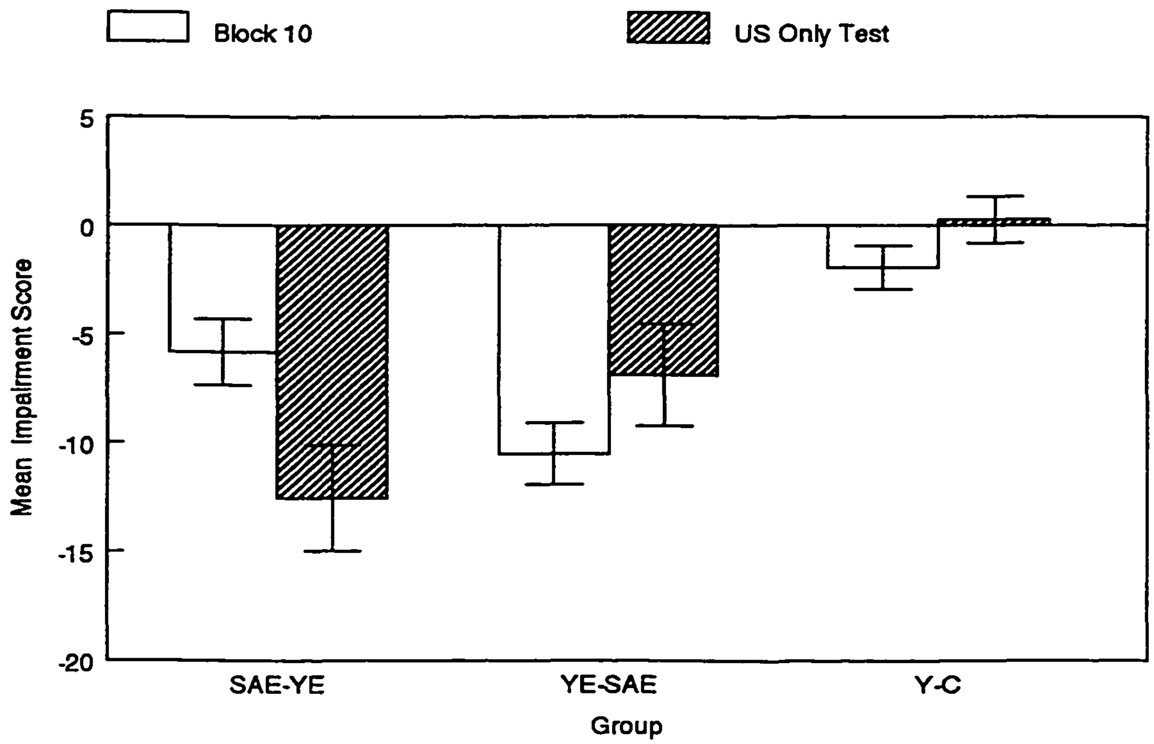

Block 10
US Only Test
Mean Dose of Ethanol Administered (g/kg)
0
1
2
3
SAE-YE
YE-SAE
Group

Figure 12.


Block 10
US Only Test
5
0
-5
-10
-15
-20
Mean Impairment Score
SAE-YE
YE-SAE
Y-C
Group

APPENDIX A

Table of solutions orally consumed and intragastrically administered

to SA-E, Y-E, and Y-C groups during Experiment 3.

	Subject		
	SA-E	Y-E	Y-C
Sweet Solution orally consumed (g)	3	0	0
33% ETH solution infused (g)	4.5	0	0
20% ETH solution infused (g)	0	7.5	0
ETH-free Solution Infused (g)	0	0	7.5
Total Fluid Infused (g)	7.5	7.5	7.5
Total ETH Infused (g)	1.5	1.5	0

APPENDIX B

Raw data collected for Experiment 1

Experiment 1
Session 1

Triad #	Group	Weight	# of Heroin Infusions	Reinforcement Schedule	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-H	467	3	CRF	56	54	53	60
	Y-H	468	3		56	48	53	54
	Y-C	453	0		54	65	60	60
4	SA-H	463	2	CRF	47	53	50	47
	Y-H	478	2		50	44	43	44
	Y-C	498	0		55	49	55	50
7	SA-H	457	2	CRF	58	61	60	64
	Y-H	438	2		55	52	50	54
	Y-C	473	0		50	51	51	56
8	SA-H	463	2	CRF	50	60	58	61
	Y-H	472	2		56	55	55	52
	Y-C	488	0		57	51	49	49
9	SA-H	500	2	CRF	50	51	61	52
	Y-H	492	2		51	52	51	52
	Y-C	535	0		49	44	50	53
10	SA-H	491	8	CRF	48	52	47	51
	Y-H	472	8		46	41	41	43
	Y-C	530	0		55	54	51	53
11	SA-H	528	4	CRF	43	50	51	56
	Y-H	514	4		47	51	53	49
	Y-C	495	0		40	55	48	51
13	SA-H	471	2	CRF	54	53	50	63
	Y-H	478	2		50	46	42	44
	Y-C	457	0		51	46	50	48
14	SA-H	515	2	CRF	49	58	53	52
	Y-H	496	2		55	50	51	39
	Y-C	495	0		49	47	44	43
17	SA-H	426	4	CRF	59	50	55	54
	Y-H	423	4		58	48	48	51
	Y-C	432	0		54	51	53	55
18	SA-H	434	6	CRF	51	51	51	52
	Y-H	437	6		57	45	51	54
	Y-C	420	0		55	49	49	54
19	SA-H	439	4	CRF	56	55	57	56
	Y-H	453	4		54	48	44	52
	Y-C	448	0		50	48	54	55
20	SA-H	464	8	CRF	48	58	50	49
	Y-H	450	8		55	50	48	52
	Y-C	453	0		55	56	55	55
21	SA-H	471	7	CRF	53	46	51	50
	Y-H	462	7		52	45	39	46
	Y-C	455	0		47	42	48	49

Experiment 1
Session 2

Triad #	Group	Weight	# of Heroin Infusions	Reinforcement Schedule	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-H	470	2	CRF	57	45	50	45
	Y-H	463	2		60	45	49	53
	Y-C	458	0		50	62	57	53
4	SA-H	470	3	CRF	54	54	57	58
	Y-H	483	3		53	58	54	51
	Y-C	508	0		63	55	64	63
7	SA-H	457	4	CRF	56	49	49	55
	Y-H	438	4		54	38	39	37
	Y-C	468	0		51	52	54	50
8	SA-H	455	5	CRF	53	55	55	52
	Y-H	462	5		51	49	46	52
	Y-C	484	0		50	49	56	50
9	SA-H	510	2	CRF	54	52	48	50
	Y-H	486	2		56	51	45	48
	Y-C	552	0		51	48	43	45
10	SA-H	487	5	CRF	40	53	49	57
	Y-H	478	5		44	55	60	52
	Y-C	531	0		53	50	50	56
11	SA-H	533	2	CRF	43	43	58	60
	Y-H	521	2		51	57	62	62
	Y-C	494	0		36	49	38	53
13	SA-H	476	3	CRF	46	47	41	48
	Y-H	469	3		43	41	37	40
	Y-C	452	0		47	45	43	53
14	SA-H	514	7	CRF	44	44	54	53
	Y-H	488	7		45	40	46	48
	Y-C	499	0		41	42	43	52
17	SA-H	415	4	CRF	49	46	48	49
	Y-H	419	4		43	42	39	45
	Y-C	423	0		45	45	53	57
18	SA-H	431	3	CRF	45	56	57	57
	Y-H	427	3		54	54	45	53
	Y-C	416	0		52	49	53	55
19	SA-H	427	5	CRF	59	61	61	61
	Y-H	440	5		54	45	46	49
	Y-C	442	0		43	42	40	43
20	SA-H	457	6	CRF	49	50	51	53
	Y-H	438	6		56	56	52	55
	Y-C	451	0		50	45	55	55
21	SA-H	463	7	CRF	48	46	49	56
	Y-H	464	7		46	35	40	46
	Y-C	450	0		50	45	48	54

Experiment 1
Session 3

Triad #	Group	Weight	# of Heroin Infusions	Reinforcement Schedule	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-H	476	2	CRF	62	50	55	60
	Y-H	468	2		64	54	52	49
	Y-C	458	0		56	51	54	51
4	SA-H	462	6	CRF	55	57	51	58
	Y-H	481	6		58	50	53	51
	Y-C	501	0		63	63	63	64
7	SA-H	462	3	CRF	49	52	50	48
	Y-H	441	3		50	53	55	48
	Y-C	473	0		50	49	48	52
8	SA-H	458	4	CRF	51	54	58	58
	Y-H	458	4		54	53	49	60
	Y-C	487	0		55	51	51	55
9	SA-H	503	2	CRF	48	49	50	52
	Y-H	486	2		55	48	49	55
	Y-C	545	0		46	48	49	49
10	SA-H	490	5	CRF	44	55	57	55
	Y-H	471	5		48	48	55	56
	Y-C	524	0		51	50	61	58
11	SA-H	536	5	CRF	51	60	54	54
	Y-H	533	5		53	58	56	56
	Y-C	495	0		40	45	54	53
13	SA-H	476	7	CRF	48	52	55	56
	Y-H	470	7		40	45	47	46
	Y-C	455	0		45	44	50	52
14	SA-H	510	7	CRF	44	55	57	55
	Y-H	486	7		44	38	45	40
	Y-C	498	0		42	41	41	40
17	SA-H	421	9	CRF	49	51	55	50
	Y-H	420	9		47	37	45	44
	Y-C	424	0		47	46	56	57
18	SA-H	440	4	CRF	48	49	59	59
	Y-H	442	4		40	40	38	48
	Y-C	421	0		51	49	51	50
19	SA-H	431	4	CRF	43	49	56	58
	Y-H	445	4		42	46	44	53
	Y-C	440	0		36	42	45	45
20	SA-H	452	8	CRF	55	54	50	55
	Y-H	443	8		54	53	52	58
	Y-C	453	0		50	57	53	51
21	SA-H	464	10	CRF	43	50	48	58
	Y-H	458	10		44	42	35	41
	Y-C	458	0		45	45	50	50

Experiment 1
Session 4

Triad #	Group	Weight	# of Heroin Infusions	Reinforcement Schedule	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-H	474	5	CRF	62	60	59	65
	Y-H	470	5		64	55	57	67
	Y-C	464	0		59	57	57	62
4	SA-H	457	5	CRF	55	54	55	57
	Y-H	482	5		60	55	55	63
	Y-C	432	0		61	61	65	55
7	SA-H	461	4	CRF	55	56	53	55
	Y-H	437	4		53	58	50	55
	Y-C	472	0		52	48	49	49
8	SA-H	467	2	CRF	49	51	55	58
	Y-H	460	2		53	54	58	62
	Y-C	488	0		48	55	51	50
9	SA-H	501	10	CRF	49	49	55	57
	Y-H	477	10		59	52	55	57
	Y-C	538	0		52	50	51	54
10	SA-H	484	2	CRF	33	45	58	57
	Y-H	471	2		39	52	50	53
	Y-C	523	0		50	50	57	55
11	SA-H	530	3	CRF	54	58	66	65
	Y-H	528	3		52	55	60	55
	Y-C	491	0		43	46	44	56
13	SA-H	477	9	CRF	49	51	58	55
	Y-H	468	9		39	40	43	43
	Y-C	454	0		48	48	46	50
14	SA-H	508	10	CRF	48	48	53	55
	Y-H	457	10		46	45	46	42
	Y-C	503	0		37	46	44	44
17	SA-H	425	4	FR3	51	52	59	56
	Y-H	418	4		46	46	50	44
	Y-C	428	0		42	50	52	53
18	SA-H	453	3	CRF	46	51	57	55
	Y-H	440	3		53	51	57	55
	Y-C	430	0		49	50	55	49
19	SA-H	429	5	CRF	58	55	58	56
	Y-H	452	5		44	52	40	46
	Y-C	447	0		40	44	52	43
20	SA-H	459	6	CRF	45	51	50	51
	Y-H	443	6		51	59	55	49
	Y-C	461	0		51	61	63	60
21	SA-H	460	8	FR3	39	53	54	55
	Y-H	453	8		50	44	52	43
	Y-C	458	0		44	41	41	43

Experiment 1
Session 5

Triad #	Group	Weight	# of Heroin Infusions	Reinforcement Schedule	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-H	475	6	CRF	63	57	58	58
	Y-H	460	6		61	54	59	52
	Y-C	453	0		57	58	61	58
4	SA-H	464	5	CRF	55	55	56	57
	Y-H	483	5		58	53	60	52
	Y-C	508	0		63	69	64	64
7	SA-H	464	4	CRF	46	39	50	49
	Y-H	438	4		60	55	49	51
	Y-C	480	0		49	52	56	57
8	SA-H	458	5	FR3	54	54	56	58
	Y-H	462	5		51	53	55	49
	Y-C	485	0		45	48	50	54
9	SA-H	495	9	FR3	51	53	57	55
	Y-H	486	9		61	50	54	45
	Y-C	555	0		55	49	49	53
10	SA-H	485	4	CRF	40	49	52	55
	Y-H	471	4		46	49	55	58
	Y-C	530	0		48	46	51	55
11	SA-H	538	2	CRF	48	51	61	59
	Y-H	534	2		43	54	60	53
	Y-C	470	0		41	57	43	67
13	SA-H	476	6	FR3	45	55	55	59
	Y-H	462	6		40	41	39	45
	Y-C	457	0		44	49	45	45
14	SA-H	504	5	FR3	44	55	56	56
	Y-H	486	5		40	44	40	43
	Y-C	504	0		45	40	40	38
17	SA-H	434	4	FR3	58	56	62	63
	Y-H	422	4		54	50	46	55
	Y-C	433	0		46	40	49	46
18	SA-H	450	2	CRF	54	55	57	58
	Y-H	443	2		61	58	54	60
	Y-C	430	0		60	57	58	57
19	SA-H	441	5	FR3	58	65	61	62
	Y-H	458	5		47	41	57	50
	Y-C	454	0		47	44	48	50
20	SA-H	468	5	FR3	48	61	60	58
	Y-H	447	5		59	49	55	56
	Y-C	463	0		55	48	55	56
21	SA-H	460	9	FR6	45	54	57	56
	Y-H	458	9		50	44	48	50
	Y-C	455	0		49	48	45	46

Experiment 1
Session 6

Triad #	Group	Weight	# of Heroin Infusions	Reinforcement Schedule	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-H	474	2	CRF	68	63	60	65
	Y-H	462	2		64	58	60	58
	Y-C	454	0		65	64	68	68
4	SA-H	462	6	FR3	55	59	56	55
	Y-H	486	6		58	58	55	58
	Y-C	496	0		64	50	65	64
7	SA-H	461	4	CRF	53	55	45	53
	Y-H	440	4		56	49	49	45
	Y-C	481	0		52	52	47	48
8	SA-H	469	2	FR3	48	55	57	55
	Y-H	457	2		61	55	62	58
	Y-C	491	0		55	49	50	49
9	SA-H	492	9	FR3	42	50	55	56
	Y-H	476	9		55	56	49	54
	Y-C	558	0		57	46	50	54
10	SA-H	487	5	FR3	41	55	56	61
	Y-H	472	5		45	56	55	50
	Y-C	528	0		45	60	50	53
11	SA-H	527	3	CRF	52	54	60	57
	Y-H	530	3		53	55	62	63
	Y-C	457	0		45	49	47	54
13	SA-H	470	6	FR3	47	58	56	59
	Y-H	461	6		40	43	48	45
	Y-C	453	0		42	40	46	45
14	SA-H	504	3	FR6	46	57	55	62
	Y-H	489	3		45	39	38	41
	Y-C	501	0		38	45	40	46
17	SA-H	428	3	FR3	54	58	63	60
	Y-H	419	3		54	53	53	58
	Y-C	429	0		50	50	47	51
18	SA-H	449	3	CRF	47	54	58	59
	Y-H	442	3		57	59	57	59
	Y-C	440	0		57	54	52	51
19	SA-H	438	4	FR3	48	53	60	58
	Y-H	460	4		45	54	51	53
	Y-C	455	0		45	49	50	53
20	SA-H	467	5	FR3	47	54	58	56
	Y-H	450	5		49	50	53	50
	Y-C	465	0		43	58	53	60
21	SA-H	467	6	FR6	42	59	63	60
	Y-H	451	6		44	54	55	48
	Y-C	461	0		53	41	46	51

Experiment 1
Session 7

Triad #	Group	Weight	# of Heroin Infusions	Reinforcement Schedule	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-H	476	9	CRF	60	63	64	63
	Y-H	464	9		63	53	57	55
	Y-C	434	0		59	58	66	62
4	SA-H	464	5	FR3	53	60	51	57
	Y-H	484	5		58	57	50	57
	Y-C	494	0		70	63	64	64
7	SA-H	457	3	FR3	48	49	55	52
	Y-H	432	3		50	49	48	50
	Y-C	477	0		55	55	48	55
8	SA-H	467	3	FR3	55	60	63	60
	Y-H	469	3		47	54	60	59
	Y-C	497	0		50	52	53	58
9	SA-H	494	11	FR3	45	49	53	50
	Y-H	478	11		49	50	45	54
	Y-C	550	0		50	46	49	47
10	SA-H	491	2	FR3	43	57	63	59
	Y-H	472	2		51	54	60	53
	Y-C	530	0		54	58	60	60
11	SA-H	544	2	FR3	52	54	60	57
	Y-H	541	2		54	54	62	50
	Y-C	462	0		47	49	49	45
13	SA-H	475	6	CRF	41	52	54	53
	Y-H	461	6		43	37	46	47
	Y-C	455	0		40	40	46	45
14	SA-H	502	2	FR6	40	53	55	56
	Y-H	488	2		41	39	39	35
	Y-C	506	0		40	39	39	41
17	SA-H	436	2	FR3	43	62	52	63
	Y-H	424	2		54	54	53	61
	Y-C	435	0		48	43	48	50
18	SA-H	457	2	CRF	59	58	53	54
	Y-H	445	2		57	55	52	58
	Y-C	437	0		55	52	50	55
19	SA-H	440	5	FR3	62	56	63	64
	Y-H	447	5		51	55	60	54
	Y-C	458	0		46	45	48	54
20	SA-H	472	6	FR3	51	58	60	60
	Y-H	444	6		46	54	52	50
	Y-C	473	0		57	59	55	63
21	SA-H	462	8	FR6	39	60	55	61
	Y-H	452	8		47	48	47	48
	Y-C	461	0		55	45	49	55

Experiment 1
Session 8

Triad #	Group	Weight	# of Heroin Infusions	Reinforcement Schedule	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-H	478	12	CRF	52	61	63	61
	Y-H	463	12		61	61	66	65
	Y-C	435	0		57	60	60	61
4	SA-H	464	3	FR6	52	51	50	55
	Y-H	489	3		59	60	53	53
	Y-C	496	0		64	58	68	61
7	SA-H	458	2	FR3	49	63	54	61
	Y-H	429	2		59	57	56	54
	Y-C	484	0		51	54	54	65
8	SA-H	471	4	FR3	55	54	62	65
	Y-H	470	4		42	43	55	58
	Y-C	499	0		49	51	54	50
9	SA-H	486	8	FR6	49	54	56	57
	Y-H	478	8		52	52	60	51
	Y-C	554	0		53	54	50	55
10	SA-H	497	2	FR3	50	53	58	60
	Y-H	470	2		56	56	52	52
	Y-C	530	0		63	59	58	57
11	SA-H	539	3	FR3	45	56	58	60
	Y-H	542	3		48	56	56	63
	Y-C	463	0		44	50	54	52
13	SA-H	478	3	CRF	43	54	57	57
	Y-H	464	3		37	40	44	45
	Y-C	458	0		38	41	42	38
14	SA-H	507	2	FR6	45	55	57	55
	Y-H	496	2		45	46	45	44
	Y-C	502	0		40	35	38	38
17	SA-H	440	3	FR3	40	59	62	63
	Y-H	436	3		40	50	48	57
	Y-C	430	0		45	43	46	44
18	SA-H	466	3	CRF	53	54	54	57
	Y-H	449	3		57	54	60	61
	Y-C	436	0		49	47	49	54
19	SA-H	442	2	FR6	60	58	59	59
	Y-H	454	2		57	55	44	51
	Y-C	458	0		46	40	48	46
20	SA-H	477	3	FR6	40	60	55	63
	Y-H	453	3		54	55	53	54
	Y-C	469	0		47	48	55	60
21	SA-H	463	3	FR10	44	50	58	63
	Y-H	458	3		45	49	49	49
	Y-C	468	0		44	52	47	54

APPENDIX C

Raw data collected for Experiment 2

Experiment 2
Session 1

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle		
					1	2	3
1	SA-E	350	16.9	41	54	39	36
	Y-E	368	18.9	41	40	40	38
	Y-C	387	0	47	46	40	45
2	SA-E	365	15.9	41	48	45	48
	Y-E	361	24.2	51	45	49	48
	Y-C	329	0	42	41	43	41
6	SA-E	372	19.1	40	50	47	44
	Y-E	351	3.9	49	49	50	53
	Y-C	343	0	45	44	45	49
8	SA-E	305	9.5	49	45	45	43
	Y-E	313	4.7	42	46	48	49
	Y-C	332	0	50	52	51	49
10	SA-E	294	16.2	51	42	42	45
	Y-E	281	29.9	49	45	43	45
	Y-C	313	0	46	39	43	41
11	SA-E	296	18.5	46	45	42	46
	Y-E	318	12.2	47	45	51	49
	Y-C	304	0	47	53	53	51
12	SA-E	299	8.9	42	45	37	41
	Y-E	278	4.9	43	36	32	41
	Y-C	273	0	46	45	44	51
13	SA-E	302	14	43	47	37	40
	Y-E	285	7.7	44	44	47	45
	Y-C	320	0	40	42	42	43

Experiment 2
Session 2

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	356	11.5	42	43	43	43
	Y-E	369	19.2	37	37	40	38
	Y-C	393	0	37	45	43	39
2	SA-E	365	16.6	40	40	45	38
	Y-E	366	28.4	45	30	31	34
	Y-C	336	0	36	43	48	44
6	SA-E	375	15.7	37	38	39	48
	Y-E	350	0	45	50	46	48
	Y-C	342	0	42	52	48	52
8	SA-E	317	10	52	39	46	47
	Y-E	323	11.5	49	54	50	52
	Y-C	313	0	51	51	54	50
10	SA-E	309	2	49	41	46	44
	Y-E	292	4.5	57	46	49	50
	Y-C	323	0	45	41	44	45
11	SA-E	303	12.4	51	43	48	43
	Y-E	320	0.1	53	46	52	45
	Y-C	308	0	47	45	49	50
12	SA-E	306	6.4	53	39	38	40
	Y-E	283	0.1	50	45	35	40
	Y-C	280	0	52	47	45	43
13	SA-E	310	10.4	49	43	44	51
	Y-E	293	18.8	50	27	24	42
	Y-C	315	0	35	43	39	38

Experiment 2
Session 3

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	355	13.1	41	47	34	39
	Y-E	366	15.1	39	34	36	32
	Y-C	399	0	47	43	47	44
2	SA-E	365	10.5	47	48	48	45
	Y-E	361	12.2	47	42	43	42
	Y-C	343	0	38	39	46	41
6	SA-E	378	14	40	42	43	44
	Y-E	351	17.8	47	23	27	21
	Y-C	350	0	47	43	42	44
8	SA-E	324	9.6	49	40	45	46
	Y-E	329	0.6	49	52	45	57
	Y-C	312	0	53	46	50	45
10	SA-E	308	16.5	54	34	39	32
	Y-E	299	14.3	53	25	26	24
	Y-C	321	0	42	48	41	40
11	SA-E	308	11	52	34	40	40
	Y-E	325	3.1	53	44	30	39
	Y-C	310	0	47	43	44	42
12	SA-E	315	9.6	51	45	46	50
	Y-E	290	11.3	44	30	40	38
	Y-C	286	0	48	47	42	47
13	SA-E	320	15.3	51	40	35	44
	Y-E	289	1	40	20	24	26
	Y-C	319	0	30	37	34	39

Experiment 2
Session 4

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	360	4.2	50	41	46	48
	Y-E	369	11.4	41	26	23	24
	Y-C	407	0	48	43	45	35
2	SA-E	372	8.2	49	49	52	52
	Y-E	368	3.7	48	44	45	49
	Y-C	350	0	45	43	42	49
6	SA-E	383	7.7	43	42	44	46
	Y-E	357	7.4	53	43	41	41
	Y-C	355	0	36	47	36	43
8	SA-E	335	4.3	47	35	47	44
	Y-E	339	3.9	48	50	46	42
	Y-C	311	0	43	47	49	55
10	SA-E	306	6.6	49	50	47	47
	Y-E	289	11.3	50	21	22	20
	Y-C	321	0	35	37	35	46
11	SA-E	314	4.4	47	43	46	48
	Y-E	330	5.6	47	45	41	41
	Y-C	317	0	47	41	45	48
12	SA-E	320	2.7	44	47	43	45
	Y-E	289	4.5	40	34	29	45
	Y-C	291	0	48	45	46	50
13	SA-E	320	3.4	48	47	48	44
	Y-E	290	8.4	47	30	25	27
	Y-C	326	0	39	43	37	38

Experiment 2
Session 5

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	363	6.8	40	37	39	38
	Y-E	366	0	44	43	43	43
	Y-C	407	0	34	38	38	37
2	SA-E	376	6.2	54	42	50	52
	Y-E	368	6.1	44	31	43	34
	Y-C	355	0	43	43	41	47
6	SA-E	383	8.2	45	40	44	42
	Y-E	357	10.1	50	27	27	27
	Y-C	355	0	40	39	37	38
8	SA-E	338	4	44	42	39	42
	Y-E	349	4.8	42	45	41	47
	Y-C	326	0	47	53	53	56
10	SA-E	313	7.5	51	29	39	34
	Y-E	281	6	48	45	42	41
	Y-C	329	0	40	41	47	41
11	SA-E	321	6	43	41	37	41
	Y-E	329	8.3	51	30	25	29
	Y-C	319	0	44	38	45	43
12	SA-E	324	5.9	52	50	48	47
	Y-E	295	5.7	44	34	26	27
	Y-C	295	0	48	52	48	49
13	SA-E	328	9.1	49	36	34	41
	Y-E	295	7.2	49	37	43	40
	Y-C	330	0	38	37	41	37

Experiment 2
Session 6

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	365	6.5	44	37	33	35
	Y-E	369	10.2	39	24	36	37
	Y-C	408	0	33	32	39	34
2	SA-E	371	7.6	47	48	43	47
	Y-E	368	8.2	48	29	37	42
	Y-C	355	0	33	44	39	39
6	SA-E	383	9.4	43	34	37	37
	Y-E	363	4.6	44	43	39	42
	Y-C	365	0	37	42	40	42
8	SA-E	340	5.8	46	36	38	37
	Y-E	349	7	37	25	31	32
	Y-C	326	0	47	53	52	58
10	SA-E	322	8.7	42	38	36	32
	Y-E	292	6.7	47	33	38	36
	Y-C	331	0	38	43	41	34
11	SA-E	329	4.9	50	36	43	46
	Y-E	334	6.2	42	30	37	29
	Y-C	324	0	43	44	43	40
12	SA-E	330	4.9	43	46	43	52
	Y-E	302	3.7	45	31	35	42
	Y-C	300	0	49	47	49	39
13	SA-E	334	4.7	49	52	45	50
	Y-E	300	8.6	37	23	26	27
	Y-C	333	0	38	36	36	40

Experiment 2
Session 7

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	367	5.3	35	33	35	37
	Y-E	363	6.5	42	29	29	36
	Y-C	410	0	35	31	32	30
2	SA-E	373	6	40	38	41	39
	Y-E	366	7.4	39	36	35	36
	Y-C	359	0	33	38	35	41
6	SA-E	384	8.3	46	28	29	31
	Y-E	358	7	44	25	20	21
	Y-C	362	0	35	40	37	36
8	SA-E	342	6.1	38	34	32	27
	Y-E	346	8	30	20	23	27
	Y-C	321	0	50	53	50	43
10	SA-E	321	8.6	44	28	37	23
	Y-E	292	7.9	46	23	31	31
	Y-C	333	0	29	37	35	34
11	SA-E	328	7.3	45	27	28	22
	Y-E	334	10.7	47	22	20	20
	Y-C	322	0	46	40	40	40
12	SA-E	334	7.3	40	50	43	37
	Y-E	302	6.3	38	38	44	34
	Y-C	295	0	44	37	34	38
13	SA-E	337	9.3	48	44	38	27
	Y-E	298	7.4	36	23	22	24
	Y-C	333	0	26	27	30	35

Experiment 2
Session 8

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	368	5.7	35	36	36	34
	Y-E	364	9.2	47	20	20	20
	Y-C	410	0	30	33	33	34
2	SA-E	375	5.4	50	47	47	44
	Y-E	379	5.2	53	54	53	49
	Y-C	360	0	33	35	42	35
6	SA-E	385	10.6	42	25	34	29
	Y-E	361	5.9	40	20	20	22
	Y-C	360	0	31	34	37	31
8	SA-E	356	4.2	33	34	35	35
	Y-E	355	5.5	37	37	37	37
	Y-C	327	0	49	46	43	43
10	SA-E	337	5.3	46	50	39	51
	Y-E	307	2.6	46	44	47	43
	Y-C	347	0	33	42	41	45
11	SA-E	338	3.4	47	42	38	41
	Y-E	342	3	50	46	45	50
	Y-C	334	0	46	43	45	45
12	SA-E	343	5.4	45	38	46	46
	Y-E	317	4.2	41	39	37	43
	Y-C	305	0	47	50	43	40
13	SA-E	348	5.6	48	46	44	45
	Y-E	312	4.5	42	30	34	37
	Y-C	347	0	38	33	32	33

Experiment 2
Session 9

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	373	5.7	44	41	42	41
	Y-E	366	7	47	38	31	28
	Y-C	414	0	38	34	39	46
2	SA-E	375	9.2	50	47	46	44
	Y-E	373	10.5	53	44	52	32
	Y-C	363	0	38	38	38	37
6	SA-E	390	9.5	43	30	40	33
	Y-E	358	9.1	46	24	20	26
	Y-C	364	0	35	30	29	33
8	SA-E	354	4.8	38	25	30	34
	Y-E	359	5.3	39	32	37	40
	Y-C	330	0	45	45	44	45
10	SA-E	337	7.6	38	37	37	33
	Y-E	306	5.6	43	38	35	35
	Y-C	348	0	31	44	35	38
11	SA-E	339	4.2	52	36	45	37
	Y-E	344	6.4	55	27	29	32
	Y-C	332	0	47	45	46	44
12	SA-E	343	7.4	50	37	29	40
	Y-E	317	6.4	40	36	24	32
	Y-C	310	0	47	50	51	42
13	SA-E	349	8	47	35	36	37
	Y-E	309	0.2	37	26	41	36
	Y-C	348	0	34	32	35	32

Experiment 2
Session 10

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	370	5.8	40	31	36	41
	Y-E	369	7.6	46	29	31	29
	Y-C	412	0	38	38	41	40
2	SA-E	370	6.2	56	47	47	47
	Y-E	365	7.4	40	30	26	42
	Y-C	361	0	37	43	40	45
6	SA-E	389	9.3	41	31	31	31
	Y-E	360	9	45	22	26	24
	Y-C	370	0	35	36	35	36
8	SA-E	364	5.7	40	27	35	28
	Y-E	360	5.1	45	30	37	40
	Y-C	334	0	42	41	41	43
10	SA-E	341	5.4	46	33	33	33
	Y-E	314	4.5	44	32	34	34
	Y-C	353	0	33	33	36	37
11	SA-E	346	6.8	60	28	33	30
	Y-E	350	8.8	56	22	24	25
	Y-C	333	0	42	42	37	43
12	SA-E	350	3	50	46	52	53
	Y-E	325	1.6	43	42	34	36
	Y-C	314	0	50	54	40	41
13	SA-E	355	8.5	42	37	44	43
	Y-E	314	3.3	38	26	26	25
	Y-C	355	0	34	29	31	32

Experiment 2
Session 11

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	383	5.5	47	41	41	41
	Y-E	373	7.6	48	30	35	36
	Y-C	410	0	40	33	37	43
2	SA-E	378	3.8	50	54	55	54
	Y-E	372	2.6	45	36	43	37
	Y-C	369	0	43	44	41	41
6	SA-E	398	8.6	47	40	36	40
	Y-E	363	8.9	52	48	43	30
	Y-C	376	0	38	36	41	36
8	SA-E	372	6.3	45	41	39	37
	Y-E	369	7.8	55	32	35	37
	Y-C	364	0	52	51	53	62
10	SA-E	349	5.9	44	39	37	40
	Y-E	321	4.6	40	37	44	45
	Y-C	367	0	34	36	40	43
11	SA-E	352	4.9	52	40	39	48
	Y-E	355	6	56	33	35	29
	Y-C	353	0	50	51	52	56
12	SA-E	359	3.8	46	48	42	50
	Y-E	335	2.7	44	31	38	42
	Y-C	318	0	49	51	51	51
13	SA-E	367	7.2	47	44	42	46
	Y-E	323	4	47	30	27	35
	Y-C	365	0	29	37	35	38

Experiment 2
Session 12

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	377	6.6	37	36	39	42
	Y-E	372	7.6	40	30	30	28
	Y-C	428	0	31	30	30	33
2	SA-E	380	6.9	53	50	50	48
	Y-E	372	7.9	38	27	36	30
	Y-C	372	0	43	43	47	40
6	SA-E	396	11	46	42	40	38
	Y-E	362	10.9	54	19	21	17
	Y-C	374	0	42	34	42	38
8	SA-E	379	5.5	34	30	30	33
	Y-E	369	6	46	29	31	37
	Y-C	340	0	50	53	50	46
10	SA-E	351	6.5	43	30	40	36
	Y-E	316	7	45	26	34	30
	Y-C	369	0	32	35	45	38
11	SA-E	350	7.1	47	30	33	36
	Y-E	359	10.4	56	19	24	37
	Y-C	353	0	39	42	47	37
12	SA-E	365	3.7	51	55	46	50
	Y-E	335	2.1	44	40	43	41
	Y-C	322	0	44	47	47	50
13	SA-E	369	7.2	54	38	42	35
	Y-E	330	1.9	43	37	42	39
	Y-C	370	0	27	27	30	30

Experiment 2
Session 13

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	381	5.8	47	35	43	43
	Y-E	373	8.6	47	24	26	22
	Y-C	422	0	40	35	38	35
2	SA-E	376	7.8	45	46	46	46
	Y-E	369	7.5	45	33	34	33
	Y-C	371	0	40	42	42	42
6	SA-E	399	10	48	30	30	35
	Y-E	359	9.9	54	24	24	23
	Y-C	371	0	33	38	36	43
8	SA-E	378	6.8	40	25	31	29
	Y-E	366	9.1	44	26	21	28
	Y-C	349	0	44	43	41	38
10	SA-E	313	6.5	42	28	34	35
	Y-E	364	7.1	41	25	26	20
	Y-C	351	0	31	33	35	47
11	SA-E	357	5.8	46	28	36	30
	Y-E	345	7.5	49	20	33	32
	Y-C	362	0	41	45	43	48
12	SA-E	338	6.1	54	-	-	-
	Y-E	320	4.5	42	-	-	-
	Y-C	372	0	43	-	-	-
13	SA-E	325	7	54	39	38	40
	Y-E	369	5.7	45	18	26	22
	Y-C	371	0	39	35	45	40

Experiment 2
Session 14

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	384	6.5	40	36	38	36
	Y-E	376	7.2	46	38	34	34
	Y-C	425	0	38	37	37	46
2	SA-E	378	9.7	46	51	51	49
	Y-E	376	10.2	40	22	28	24
	Y-C	379	0	41	40	45	43
6	SA-E	399	11.2	42	30	34	31
	Y-E	363	9.1	50	33	25	33
	Y-C	371	0	38	34	34	34
8	SA-E	380	5.5	33	-	-	-
	Y-E	366	6	53	-	-	-
	Y-C	342	0	55	-	-	-
10	SA-E	356	5.9	35	36	31	35
	Y-E	314	7	47	26	31	28
	Y-C	370	0	35	44	46	41
11	SA-E	358	4	44	35	39	32
	Y-E	366	5.1	57	27	36	26
	Y-C	346	0	44	47	42	40
12	SA-E	360	5.1	48	50	46	46
	Y-E	340	3.9	49	34	37	39
	Y-C	319	0	52	40	45	50
13	SA-E	376	6.8	54	38	46	43
	Y-E	358	9.4	45	34	49	35
	Y-C	372	0	49	40	37	44

Experiment 2
Session 15

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	386	6.3	35	34	40	42
	Y-E	379	7.9	49	28	28	31
	Y-C	433	0	36	34	33	34
2	SA-E	373	5.4	50	46	58	61
	Y-E	377	4.9	40	33	37	34
	Y-C	379	0	37	38	39	43
6	SA-E	400	11.9	41	26	26	26
	Y-E	368	9.5	54	20	22	17
	Y-C	378	0	29	26	27	31
8	SA-E	386	4.2	45	27	45	40
	Y-E	377	3.9	60	44	38	34
	Y-C	351	0	47	50	55	56
10	SA-E	360	3.8	42	-	-	-
	Y-E	323	3.8	52	-	-	-
	Y-C	373	0	41	-	-	-
11	SA-E	360	5.9	39	30	29	27
	Y-E	367	6.5	49	24	23	35
	Y-C	350	0	35	37	41	44
12	SA-E	364	4.7	48	44	54	47
	Y-E	347	4.6	39	40	36	33
	Y-C	327	0	42	46	46	44
13	SA-E	382	6	43	39	35	40
	Y-E	328	5.5	38	35	27	33
	Y-C	378	0	34	38	34	38

Experiment 2
Session 16

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	374	4.4	42	33	41	43
	Y-E	383	5.9	38	33	32	39
	Y-C	434	0	43	36	30	34
2	SA-E	380	6.2	44	50	49	52
	Y-E	376	6.8	39	31	33	30
	Y-C	389	0	38	38	47	41
6	SA-E	406	9.3	49	40	41	40
	Y-E	368	8.2	46	23	25	28
	Y-C	385	0	35	32	45	33
8	SA-E	392	4.3	37	30	39	36
	Y-E	374	4.7	43	40	47	34
	Y-C	355	0	45	48	38	40
10	SA-E	366	7.1	37	29	33	36
	Y-E	326	5.3	54	37	35	35
	Y-C	372	0	31	37	39	39
11	SA-E	361	6.1	47	-	-	-
	Y-E	374	5.3	57	-	-	-
	Y-C	356	0	38	-	-	-
12	SA-E	367	5.2	51	51	51	53
	Y-E	348	0.1	40	41	40	33
	Y-C	331	0	51	45	41	45
13	SA-E	388	7.2	53	41	38	46
	Y-E	338	6.7	39	30	30	25
	Y-C	398	0	27	35	30	36

Experiment 2
Session 17

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	387	9.4	44	34	35	36
	Y-E	382	10.5	46	30	25	24
	Y-C	432	0	40	39	49	43
2	SA-E	378	8.9	46	50	50	50
	Y-E	372	8	38	37	38	39
	Y-C	383	0	37	43	40	43
6	SA-E	401	14.2	48	33	33	31
	Y-E	369	11.3	43	16	20	20
	Y-C	376	0	43	38	35	46
8	SA-E	400	5.3	39	38	30	40
	Y-E	377	4.5	50	33	35	37
	Y-C	353	0	48	45	41	40
10	SA-E	361	8.5	46	28	26	28
	Y-E	328	6.9	46	21	26	24
	Y-C	376	0	38	43	50	44
11	SA-E	360	9.2	42	27	23	34
	Y-E	379	9.4	52	30	31	28
	Y-C	360	0	47	36	38	40
12	SA-E	375	4.7	50	53	50	50
	Y-E	352	3.4	42	35	33	29
	Y-C	333	0	41	40	42	41
13	SA-E	390	7.1	40	-	-	-
	Y-E	345	5.3	46	-	-	-
	Y-C	406	0	28	-	-	-

Experiment 2
Session 18

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	396	3.4	43	42	40	45
	Y-E	383	6.2	49	35	37	37
	Y-C	438	0	28	40	35	34
2	SA-E	380	4.2	53	49	52	50
	Y-E	382	3.7	33	30	30	29
	Y-C	388	0	31	38	37	40
6	SA-E	404	7.8	45	40	39	36
	Y-E	370	5.7	53	26	25	25
	Y-C	383	0	34	34	31	32
8	SA-E	407	3	26	35	30	32
	Y-E	385	3.2	44	37	37	45
	Y-C	360	0	40	40	37	43
10	SA-E	367	7.6	44	29	23	28
	Y-E	336	6.5	46	24	25	25
	Y-C	385	0	47	32	34	38
11	SA-E	369	2.7	47	44	51	46
	Y-E	382	1.9	45	46	36	52
	Y-C	363	0	28	34	46	39
12	SA-E	376	6.3	48	49	46	46
	Y-E	361	4.7	44	33	29	34
	Y-C	340	0	47	42	45	52
13	SA-E	398	5	50	38	42	45
	Y-E	341	3.3	36	37	40	30
	Y-C	311	0	20	26	30	29

Experiment 2
Session 19

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	400	3.6	35	35	40	40
	Y-E	388	5	48	37	31	33
	Y-C	440	0	30	38	33	33
2	SA-E	390	4.4	57	55	48	57
	Y-E	386	4	33	35	20	32
	Y-C	394	0	34	38	39	42
6	SA-E	411	10.5	39	38	35	35
	Y-E	371	10	50	27	25	30
	Y-C	385	0	34	30	30	29
8	SA-E	405	5.6	36	26	31	29
	Y-E	384	6.3	38	26	31	30
	Y-C	362	0	41	43	43	41
10	SA-E	362	8.1	47	32	31	26
	Y-E	333	5.8	57	20	30	29
	Y-C	382	0	28	34	46	45
11	SA-E	369	4.8	49	37	42	36
	Y-E	382	4.8	55	43	32	27
	Y-C	366	0	38	39	43	42
12	SA-E	378	5.9	44	43	46	55
	Y-E	357	4.3	36	26	34	32
	Y-C	336	0	44	41	40	44
13	SA-E	398	14.4	51	32	30	36
	Y-E	336	10.6	38	25	30	24
	Y-C	400	0	32	23	27	31

Experiment 2
Session 20

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
1	SA-E	401	6	35	36	41	42
	Y-E	394	6.2	40	27	27	32
	Y-C	440	0	33	35	35	37
2	SA-E	390	5.1	50	48	45	54
	Y-E	388	3.1	40	37	31	30
	Y-C	389	0	35	45	37	40
6	SA-E	400	11	44	41	35	35
	Y-E	375	7.8	51	24	27	23
	Y-C	389	0	35	28	32	34
8	SA-E	407	6	41	35	33	36
	Y-E	384	6.5	50	35	36	38
	Y-C	361	0	48	54	51	58
10	SA-E	366	7.9	43	25	23	26
	Y-E	336	5.8	55	26	24	26
	Y-C	383	0	35	41	39	46
11	SA-E	371	5.9	52	41	39	41
	Y-E	386	6.2	60	40	41	40
	Y-C	369	0	47	49	52	47
12	SA-E	380	6.4	52	48	53	48
	Y-E	361	5	36	35	34	27
	Y-C	340	0	44	49	46	42
13	SA-E	399	11.7	54	39	40	34
	Y-E	340	8.8	46	34	34	35
	Y-C	412	0	35	35	35	32

APPENDIX D

Raw data collected for Experiment 3

Experiment 3
Session 1

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	405	3	38	40	44	40
	Y-E	408	4.5	46	30	30	35
	Y-C	410	0	38	41	40	41
3	SA-E	400	1.5	48	51	50	42
	Y-E	404	3.5	50	45	42	46
	Y-C	408	0	46	51	53	51
4	SA-E	406	2.3	44	42	42	44
	Y-E	405	5.3	47	43	45	44
	Y-C	427	0	50	51	52	52
6	SA-E	449	2	51	48	46	47
	Y-E	454	1.8	49	43	54	52
	Y-C	446	0	51	59	51	58
7	SA-E	465	5.5	48	35	34	35
	Y-E	394	7.7	63	52	57	43
	Y-C	418	0	59	60	56	58
8	SA-E	373	1.5	64	55	61	58
	Y-E	447	6.7	53	39	43	40
	Y-C	435	0	58	54	52	53
9	SA-E	426	4.2	45	37	39	35
	Y-E	364	7.2	53	39	43	38
	Y-C	465	0	54	53	53	52
10	SA-E	348	3.7	58	56	48	51
	Y-E	408	5.8	48	44	55	51
	Y-C	444	0	65	64	64	64
11	SA-E	390	5.8	51	41	36	33
	Y-E	444	6.7	44	46	44	46
	Y-C	430	0	52	55	54	53
14	SA-E	438	3.7	50	48	46	47
	Y-E	418	0	47	51	54	56
	Y-C	408	0	53	54	60	56
15	SA-E	393	4.3	49	40	44	42
	Y-E	366	5.2	59	54	64	59
	Y-C	373	0	50	60	55	54
16	SA-E	360	4.6	59	57	52	57
	Y-E	364	5.5	55	54	54	62
	Y-C	383	0	48	55	55	55
17	SA-E	373	3.9	56	53	53	55
	Y-E	413	5.4	59	45	58	55
	Y-C	375	0	53	50	50	54

19	SA-E	349	5	60	33	30	33
	Y-E	370	8.9	56	37	35	44
	Y-C	386	0	62	64	60	59
20	SA-E	400	4.8	59	30	34	34
	Y-E	410	8.8	58	30	30	33
	Y-C	367	0	64	52	58	59
21	SA-E	382	4.2	50	35	42	38
	Y-E	370	7.2	64	64	54	60
	Y-C	403	0	50	60	54	57
22	SA-E	366	4.9	55	34	36	35
	Y-E	399	5.9	55	39	40	40
	Y-C	350	0	57	64	56	56
24	SA-E	426	0	50	41	48	42
	Y-E	364	5.1	51	45	59	52
	Y-C	428	0	47	47	47	50
25	SA-E	362	4.3	51	25	26	29
	Y-E	416	6.8	50	31	39	35
	Y-C	400	0	45	52	52	57
26	SA-E	398	4.6	49	44	40	42
	Y-E	388	0.1	50	56	54	50
	Y-C	378	0	57	55	45	50
27	SA-E	398	4.6	56	29	29	42
	Y-E	400	5.8	57	40	35	34
	Y-C	421	0	59	50	54	47
28	SA-E	385	4.5	52	53	48	50
	Y-E	380	7.6	51	36	33	30
	Y-C	370	0	52	48	47	47
31	SA-E	409	4.7	43	26	26	27
	Y-E	362	6.9	48	32	27	31
	Y-C	391	0	47	52	52	50
32	SA-E	404	4.6	38	39	36	35
	Y-E	419	7.8	48	30	44	56
	Y-C	375	0	58	54	57	39
33	SA-E	393	4.9	49	27	30	25
	Y-E	407	7.4	56	33	30	40
	Y-C	445	0	49	44	57	53
34	SA-E	454	4.5	45	30	38	36
	Y-E	411	7.2	47	28	31	35
	Y-C	400	0	43	55	44	54
35	SA-E	418	4.8	46	28	32	29
	Y-E	422	7	41	50	49	39
	Y-C	430	0	45	55	50	58

36	SA-E	436	4.9	48	24	41	33
	Y-E	417	5.9	52	52	45	53
	Y-C	370	0	51	48	55	52
37	SA-E	400	4.5	57	35	31	37
	Y-E	402	6.8	52	40	52	40
	Y-C	417	0	45	42	51	44
38	SA-E	386	4.5	46	30	35	32
	Y-E	437	7.9	40	34	29	32
	Y-C	385	0	44	52	50	56
39	SA-E	410	4.4	44	32	41	28
	Y-E	375	6.9	43	30	36	32
	Y-C	398	0	47	47	41	49
40	SA-E	437	4.8	42	30	50	36
	Y-E	410	6.9	60	44	44	44
	Y-C	372	0	55	54	51	41
41	SA-E	440	3.9	59	55	54	52
	Y-E	376	8.4	50	35	35	38
	Y-C	402	0	54	54	52	56
42	SA-E	389	5	55	38	45	43
	Y-E	412	5.4	60	48	44	40
	Y-C	373	0	54	55	49	47
43	SA-E	348	1.1	54	50	45	53
	Y-E	3632	1.6	59	44	55	47
	Y-C	456	0	59	58	56	58
44	SA-E	420	5.4	48	35	36	43
	Y-E	403	8.1	55	33	29	31
	Y-C	330	0	50	50	50	55
46	SA-E	382	5.1	55	30	33	29
	Y-E	412	6.5	60	38	55	43
	Y-C	408	0	53	47	45	48
47	SA-E	423	4.5	59	35	35	39
	Y-E	385	9.2	55	29	34	33
	Y-C	433	0	52	58	52	58

Experiment 3
Session 2

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle		
					1	2	3
2	SA-E	397	3.7	46	45	37	43
	Y-E	400	4.4	48	44	41	43
	Y-C	410	0	50	50	43	48
3	SA-E	393	4.2	46	28	39	29
	Y-E	401	4.7	45	45	50	44
	Y-C	408	0	48	55	48	48
4	SA-E	405	0.7	44	45	47	45
	Y-E	406	0.8	42	45	50	55
	Y-C	427	0	49	52	58	58
6	SA-E	442	5.1	42	29	35	42
	Y-E	463	4.6	41	44	39	32
	Y-C	444	0	51	57	54	63
7	SA-E	455	4.4	48	32	33	44
	Y-E	402	5.8	54	46	48	57
	Y-C	419	0	47	46	55	50
8	SA-E	372	4.6	58	56	57	56
	Y-E	439	7.2	58	42	43	46
	Y-C	426	0	51	47	48	58
9	SA-E	419	3.7	54	49	53	45
	Y-E	353	4.2	60	52	44	56
	Y-C	468	0	49	53	57	49
10	SA-E	341	4.2	62	45	50	43
	Y-E	403	6.2	52	47	44	44
	Y-C	444	0	59	64	56	59
11	SA-E	378	2.8	56	55	46	48
	Y-E	436	2.9	44	54	53	50
	Y-C	428	0	57	58	52	57
14	SA-E	432	4.1	55	39	44	45
	Y-E	418	5.7	49	38	45	43
	Y-C	405	0	48	52	54	56
15	SA-E	385	3.2	49	35	47	50
	Y-E	362	4.9	50	48	57	52
	Y-C	372	0	47	53	45	54
16	SA-E	343	3.2	55	46	56	52
	Y-E	364	3.9	54	51	53	54
	Y-C	380	0	53	57	53	59
17	SA-E	370	1.4	56	57	60	58
	Y-E	405	1.4	52	51	46	47
	Y-C	371	0	53	59	53	52

19	SA-E	331	3.4	41	38	42	40
	Y-E	357	3.2	53	43	42	44
	Y-C	382	0	61	62	64	60
20	SA-E	380	4.4	53	34	34	33
	Y-E	398	8.2	52	39	30	33
	Y-C	364	0	53	50	53	59
21	SA-E	373	5.3	56	29	29	28
	Y-E	362	8.7	49	42	45	38
	Y-C	403	0	53	46	55	55
22	SA-E	358	4	43	43	50	37
	Y-E	388	8.5	54	42	39	46
	Y-C	344	0	57	53	57	56
24	SA-E	426	4.5	48	27	28	31
	Y-E	354	8.1	51	22	28	28
	Y-C	418	0	41	51	48	50
25	SA-E	357	4.5	50	32	29	28
	Y-E	410	4.9	42	57	43	52
	Y-C	392	0	44	46	45	41
26	SA-E	393	4.5	40	39	46	35
	Y-E	383	4.8	48	50	42	45
	Y-C	367	0	47	47	45	50
27	SA-E	395	2.7	54	59	54	45
	Y-E	391	1.8	45	45	45	45
	Y-C	407	0	45	59	55	56
28	SA-E	379	4.7	45	33	33	34
	Y-E	375	8.1	50	27	30	26
	Y-C	362	0	44	51	47	50
31	SA-E	391	5	46	46	46	42
	Y-E	350	7.5	42	35	30	30
	Y-C	383	0	55	45	60	56
32	SA-E	396	1.8	38	45	43	48
	Y-E	411	2.4	45	39	35	43
	Y-C	371	0	43	52	60	58
33	SA-E	383	3.1	43	57	48	55
	Y-E	396	3.1	41	52	44	45
	Y-C	447	0	44	47	47	47
34	SA-E	453	1.6	38	35	50	49
	Y-E	406	2.5	36	35	41	40
	Y-C	404	0	33	53	43	46
35	SA-E	420	2.7	44	37	42	44
	Y-E	413	1.2	40	52	45	44
	Y-C	433	0	40	48	54	47

36	SA-E	426	2.2	39	54	35	41
	Y-E	417	3.8	41	45	43	35
	Y-C	367	0	44	47	39	50
37	SA-E	390	1.7	40	47	47	48
	Y-E	399	2.3	59	57	54	45
	Y-C	412	0	36	43	43	39
38	SA-E	374	0.1	49	54	48	49
	Y-E	426	1.3	40	40	52	43
	Y-C	383	0	40	44	46	40
39	SA-E	400	2.3	42	44	39	48
	Y-E	365	2.8	41	34	39	38
	Y-C	389	0	45	46	50	50
40	SA-E	423	2.6	46	60	40	51
	Y-E	406	4.6	54	60	60	54
	Y-C	366	0	49	55	49	55
41	SA-E	430	0.3	55	49	53	45
	Y-E	360	0.7	45	43	53	48
	Y-C	402	0	50	59	52	53
42	SA-E	379	2.8	62	49	50	58
	Y-E	397	4.9	50	54	49	49
	Y-C	372	0	50	46	49	52
43	SA-E	348	4.9	52	34	35	36
	Y-E	355	6.2	63	35	55	35
	Y-C	462	0	56	55	59	54
44	SA-E	392	4.8	50	38	35	37
	Y-E	394	8.3	50	30	28	30
	Y-C	322	0	53	45	45	45
46	SA-E	367	2.6	46	55	50	50
	Y-E	392	4.8	49	57	56	54
	Y-C	404	0	44	46	49	43
47	SA-E	410	0.3	50	57	55	45
	Y-E	363	0.5	49	49	50	40
	Y-C	422	0	46	53	44	50

Experiment 3
Session 3

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	396	1.7	45	54	50	48
	Y-E	398	1.9	44	44	44	39
	Y-C	412	0	48	44	46	48
3	SA-E	389	3.4	48	-	-	-
	Y-E	404	4	49	-	-	-
	Y-C	411	0	49	-	-	-
4	SA-E	412	3.9	44	34	33	32
	Y-E	410	3.5	45	48	44	43
	Y-C	429	0	50	56	55	59
6	SA-E	445	0.1	49	50	46	47
	Y-E	470	0.1	44	49	44	52
	Y-C	444	0	51	50	53	54
7	SA-E	456	0.9	48	55	54	58
	Y-E	394	2.4	58	48	49	53
	Y-C	432	0	59	65	60	59
8	SA-E	379	3.9	53	41	43	37
	Y-E	440	5.4	60	64	64	59
	Y-C	433	0	56	56	59	54
9	SA-E	442	2	48	56	60	59
	Y-E	362	2.5	59	54	62	52
	Y-C	469	0	55	53	44	48
10	SA-E	340	3.7	56	44	43	44
	Y-E	410	4.9	51	47	45	58
	Y-C	448	0	64	66	65	65
11	SA-E	385	3.1	58	50	52	43
	Y-E	441	3.7	54	60	56	54
	Y-C	437	0	54	56	65	65
14	SA-E	433	1.8	48	50	53	48
	Y-E	413	3	53	58	55	58
	Y-C	408	0	54	55	60	60
15	SA-E	385	3.4	45	45	45	43
	Y-E	361	4.7	51	65	56	43
	Y-C	371	0	47	52	49	52
16	SA-E	338	3.3	50	50	46	45
	Y-E	365	4.6	45	45	46	50
	Y-C	388	0	54	50	54	53
17	SA-E	369	3.4	57	40	49	46
	Y-E	409	5.7	47	50	45	44
	Y-C	324	0	50	54	57	55

19	SA-E	357	1.7	51	44	48	49
	Y-E	387	2.9	49	48	53	43
	Y-C	379	0	65	62	64	64
20	SA-E	397	3.6	53	55	64	56
	Y-E	369	5.1	48	46	47	54
	Y-C	357	0	44	56	51	48
21	SA-E	361	3.7	52	55	51	58
	Y-E	404	0.6	50	63	63	58
	Y-C	360	0	48	49	48	62
22	SA-E	384	2.2	42	48	48	48
	Y-E	348	3	45	48	52	56
	Y-C	385	0	51	52	58	50
24	SA-E	412	1.4	45	45	48	45
	Y-E	344	1.7	45	50	52	48
	Y-C	419	0	50	48	48	46
25	SA-E	350	4.1	50	40	40	40
	Y-E	410	2.2	50	43	51	50
	Y-C	392	0	40	50	46	50
26	SA-E	386	0.4	44	44	46	49
	Y-E	380	0.6	51	51	53	60
	Y-C	368	0	48	53	52	52
27	SA-E	393	5.8	53	25	25	25
	Y-E	394	0.4	46	33	43	48
	Y-C	416	0	55	40	53	54
28	SA-E	376	0.4	44	48	50	53
	Y-E	361	0.7	39	46	50	50
	Y-C	363	0	48	47	50	50
31	SA-E	394	0.3	45	25	23	25
	Y-E	349	0.4	50	40	54	53
	Y-C	383	0	45	53	56	56
32	SA-E	401	2.6	43	39	46	47
	Y-E	416	4.5	46	37	39	43
	Y-C	368	0	57	60	58	52
33	SA-E	384	4.2	44	34	43	41
	Y-E	397	4.6	48	47	38	50
	Y-C	450	0	45	59	59	62
34	SA-E	453	4.6	47	43	48	38
	Y-E	407	6.3	54	35	40	36
	Y-C	404	0	46	49	54	55
35	SA-E	413	4.4	50	-	-	-
	Y-E	416	6.3	44	-	-	-
	Y-C	432	0	49	-	-	-

36	SA-E	434	2.9	54	43	44	49
	Y-E	411	8.1	44	50	43	44
	Y-C	370	0	38	51	58	56
37	SA-E	387	2.4	49	-	-	-
	Y-E	402	3.2	54	-	-	-
	Y-C	414	0	47	-	-	-
38	SA-E	378	1.2	43	53	43	49
	Y-E	431	5.8	45	40	39	40
	Y-C	379	0	44	46	49	50
39	SA-E	407	1.3	45	41	45	50
	Y-E	367	2.5	44	45	43	40
	Y-C	385	0	46	47	53	54
40	SA-E	431	4.6	45	50	50	53
	Y-E	416	8.3	55	30	34	43
	Y-C	368	0	50	55	60	57
41	SA-E	435	0.4	54	57	59	52
	Y-E	372	0.7	55	48	50	53
	Y-C	410	0	53	53	54	58
42	SA-E	388	2	57	58	53	47
	Y-E	400	3.1	52	54	55	54
	Y-C	380	0	55	53	54	54
43	SA-E	341	4.1	48	45	52	53
	Y-E	344	6.4	55	39	44	45
	Y-C	462	0	59	54	51	53
44	SA-E	393	2.8	54	49	46	50
	Y-E	395	4.2	52	55	53	48
	Y-C	328	0	48	44	48	48
46	SA-E	370	1.8	58	52	46	49
	Y-E	397	2.6	50	54	54	58
	Y-C	403	0	49	55	56	45
47	SA-E	419	1.7	56	48	52	61
	Y-E	364	2.7	50	42	54	54
	Y-C	427	0	57	50	55	58

Experiment 3
Session 4

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	415	0.3	58	48	54	49
	Y-E	408	0.3	44	54	48	42
	Y-C	422	0	50	51	44	45
3	SA-E	396	2	48	48	46	48
	Y-E	408	2.9	50	49	48	45
	Y-C	423	0	48	49	52	54
4	SA-E	418	0.1	44	47	48	46
	Y-E	417	0.1	54	55	45	51
	Y-C	436	0	55	57	58	57
6	SA-E	465	3.3	50	-	-	-
	Y-E	480	4.6	56	-	-	-
	Y-C	459	0	51	-	-	-
7	SA-E	462	4.4	54	53	55	49
	Y-E	396	7.8	60	48	42	49
	Y-C	434	0	56	58	60	63
8	SA-E	370	3.2	53	39	41	37
	Y-E	433	7.3	54	53	45	53
	Y-C	460	0	58	54	48	59
9	SA-E	425	4.8	52	60	54	57
	Y-E	362	8.4	54	44	32	34
	Y-C	473	0	54	59	56	58
10	SA-E	338	3.9	59	42	43	45
	Y-E	404	5.3	54	53	47	51
	Y-C	442	0	60	60	63	64
11	SA-E	383	4.9	60	48	53	61
	Y-E	435	8	52	44	40	41
	Y-C	435	0	53	55	58	60
14	SA-E	435	2.2	53	45	55	54
	Y-E	416	5.6	53	49	50	46
	Y-C	399	0	55	55	56	63
15	SA-E	381	3.4	50	52	49	48
	Y-E	363	4.9	51	50	50	50
	Y-C	369	0	51	54	54	52
16	SA-E	336	0.6	53	56	49	53
	Y-E	366	0.8	51	53	49	45
	Y-C	390	0	52	54	53	53
17	SA-E	367	1.2	60	-	-	-
	Y-E	403	2	50	-	-	-
	Y-C	379	0	56	-	-	-

19	SA-E	339	3.9	52	45	41	47
	Y-E	355	0	48	47	56	61
	Y-C	389	0	57	64	54	61
20	SA-E	379	3.4	50	-	-	-
	Y-E	399	8.3	48	-	-	-
	Y-C	371	0	54	-	-	-
21	SA-E	358	4.3	51	-	-	-
	Y-E	361	7.4	57	-	-	-
	Y-C	410	0	50	-	-	-
22	SA-E	362	5.1	45	46	39	38
	Y-E	390	7.2	52	33	43	47
	Y-C	347	0	55	57	56	64
24	SA-E	420	1	42	47	45	40
	Y-E	345	1	44	45	44	45
	Y-C	425	0	40	49	47	46
25	SA-E	355	3.1	48	-	-	-
	Y-E	421	4	47	-	-	-
	Y-C	401	0	47	-	-	-
26	SA-E	388	1.7	42	44	44	36
	Y-E	388	2	52	51	56	40
	Y-C	372	0	52	44	50	50
27	SA-E	385	0.6	55	48	59	52
	Y-E	397	0.9	53	47	45	44
	Y-C	420	0	51	51	45	52
28	SA-E	379	1	55	50	48	55
	Y-E	369	1.4	57	50	57	56
	Y-C	367	0	52	63	49	57
31	SA-E	387	1.2	56	46	48	47
	Y-E	353	1.7	53	56	58	65
	Y-C	397	0	53	57	57	64
32	SA-E	391	4	41	39	40	34
	Y-E	408	7.1	41	39	37	33
	Y-C	350	0	50	64	56	55
33	SA-E	384	0.7	43	53	46	49
	Y-E	391	1.3	45	44	44	43
	Y-C	433	0	58	61	54	60
34	SA-E	440	4.2	41	39	43	39
	Y-E	404	6.2	39	24	24	24
	Y-C	391	0	45	54	54	65
35	SA-E	407	4.6	52	48	50	49
	Y-E	403	2.9	44	44	46	54
	Y-C	419	0	49	46	50	44

36	SA-E	423	3.8	45	43	54	50
	Y-E	406	6.9	47	45	55	44
	Y-C	361	0	42	50	55	59
37	SA-E	384	3.8	55	44	50	49
	Y-E	398	7.3	53	40	39	50
	Y-C	402	0	38	42	49	43
38	SA-E	378	0.9	41	49	53	47
	Y-E	423	1.6	46	59	53	49
	Y-C	374	0	44	45	49	50
39	SA-E	402	4.4	48	45	47	43
	Y-E	365	9	39	32	43	42
	Y-C	381	0	46	49	50	58
40	SA-E	439	4.6	46	25	26	34
	Y-E	406	7.8	55	25	25	29
	Y-C	372	0	55	63	55	63
41	SA-E	438	0.3	50	46	52	45
	Y-E	373	0.9	54	47	53	49
	Y-C	414	0	57	50	57	59
42	SA-E	392	2.6	47	54	52	51
	Y-E	403	3.8	48	51	52	57
	Y-C	378	0	54	58	58	56
43	SA-E	342	0.8	49	54	55	56
	Y-E	342	1.3	53	49	52	62
	Y-C	464	0	48	55	56	64
44	SA-E	402	2	53	47	53	50
	Y-E	395	3.3	49	50	50	45
	Y-C	333	0	48	50	48	49
46	SA-E	368	1	45	55	53	50
	Y-E	390	1.5	52	50	58	62
	Y-C	410	0	51	45	50	45
47	SA-E	413	0.2	50	49	48	50
	Y-E	367	0.4	52	48	47	48
	Y-C	427	0	53	53	54	50

Experiment 3
Session 5

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	414	2.5	54	44	51	48
	Y-E	404	3.6	43	40	45	44
	Y-C	418	0	44	52	54	51
3	SA-E	397	3	49	54	44	39
	Y-E	408	4.2	47	49	47	46
	Y-C	423	0	50	57	59	53
4	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
6	SA-E	456	1.5	49	50	43	45
	Y-E	479	5.7	46	38	45	48
	Y-C	455	0	50	54	49	53
7	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
8	SA-E	368	4.7	61	46	44	44
	Y-E	442	6.2	61	63	60	52
	Y-C	437	0	56	54	53	50
9	SA-E	430	5.1	55	40	41	40
	Y-E	350	8.3	53	31	35	32
	Y-C	485	0	49	57	60	63
10	SA-E	338	1.6	55	51	58	54
	Y-E	403	2.3	46	51	59	53
	Y-C	445	0	48	62	67	72
11	SA-E	396	3.6	50	44	44	36
	Y-E	431	8	54	49	36	40
	Y-C	440	0	59	54	56	49
14	SA-E	435	0.8	52	59	54	55
	Y-E	423	1	55	51	50	53
	Y-C	400	0	60	56	55	58
15	SA-E	389	3.3	54	43	52	48
	Y-E	369	5	53	55	54	56
	Y-C	374	0	54	48	52	60
16	SA-E	350	3.3	51	54	62	58
	Y-E	374	4.2	46	52	54	52
	Y-C	406	0	51	53	52	52
17	SA-E	377	4.4	49	56	62	58
	Y-E	411	6.4	51	45	50	51
	Y-C	391	0	55	57	57	57

19	SA-E	339	0.3	48	54	55	57
	Y-E	370	5.2	48	45	44	43
	Y-C	396	0	55	58	59	65
20	SA-E	389	0.9	48	53	55	53
	Y-E	401	1.1	53	51	53	56
	Y-C	383	0	58	55	54	55
21	SA-E	367	0.2	55	53	57	55
	Y-E	364	0.4	60	62	56	54
	Y-C	427	0	53	62	51	53
22	SA-E	366	0.8	51	49	50	53
	Y-E	425	1.1	58	60	54	57
	Y-C	362	0	55	45	55	53
24	SA-E	420	4.7	51	24	28	28
	Y-E	340	8	42	25	26	21
	Y-C	417	0	45	47	44	47
25	SA-E	348	1.8	44	39	45	40
	Y-E	412	2.4	43	40	44	45
	Y-C	394	0	46	45	43	46
26	SA-E	386	5.2	43	33	31	35
	Y-E	384	7.8	47	33	28	31
	Y-C	365	0	52	40	46	46
27	SA-E	382	2.7	55	48	38	45
	Y-E	390	2.8	47	46	40	40
	Y-C	411	0	53	51	56	56
28	SA-E	374	3.8	41	52	50	44
	Y-E	366	5.4	53	38	34	35
	Y-C	362	0	50	46	61	55
31	SA-E	390	5	49	32	26	30
	Y-E	348	3	54	44	59	45
	Y-C	390	0	48	56	60	52
32	SA-E	396	0.4	45	49	46	54
	Y-E	414	0.8	45	54	47	40
	Y-C	355	0	54	52	58	45
33	SA-E	380	0.5	50	50	44	58
	Y-E	400	1	45	45	50	47
	Y-C	440	0	60	55	63	65
34	SA-E	455	3.1	48	55	51	59
	Y-E	407	0.2	49	34	40	41
	Y-C	399	0	50	55	55	60
35	SA-E	417	4.8	54	60	54	60
	Y-E	415	0.6	57	46	50	45
	Y-C	428	0	60	55	60	60

36	SA-E	427	1.3	48	45	56	59
	Y-E	410	2.5	41	48	45	46
	Y-C	377	0	40	50	49	49
37	SA-E	386	1.8	57	55	62	63
	Y-E	397	3.6	50	50	54	53
	Y-C	413	0	45	46	42	45
38	SA-E	384	1.6	48	55	57	53
	Y-E	432	3	55	54	48	65
	Y-C	389	0	49	44	51	50
39	SA-E	412	0.2	54	49	50	58
	Y-E	368	0.3	45	44	50	44
	Y-C	383	0	45	52	52	54
40	SA-E	420	2.5	45	39	47	39
	Y-E	392	4.3	52	44	52	58
	Y-C	371	0	52	59	55	58
41	SA-E	438	1.5	50	47	48	48
	Y-E	367	2.3	53	48	44	42
	Y-C	410	0	50	54	48	52
42	SA-E	382	3.4	57	43	48	44
	Y-E	401	5.7	56	43	45	53
	Y-C	370	0	58	52	53	58
43	SA-E	346	1.1	49	44	51	55
	Y-E	344	1.9	53	47	46	52
	Y-C	457	0	60	50	45	44
44	SA-E	403	4.3	48	42	45	46
	Y-E	390	7.3	54	32	34	44
	Y-C	332	0	49	50	45	47
46	SA-E	370	1.5	42	55	54	49
	Y-E	388	2.5	52	50	59	49
	Y-C	413	0	47	50	52	56
47	SA-E	409	2.3	50	46	40	45
	Y-E	368	3.5	60	52	52	56
	Y-C	422	0	50	55	53	52

Experiment 3
Session 6

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
3	SA-E	398	1.3	49	46	50	43
	Y-E	406	2	46	47	44	44
	Y-C	423	0	55	49	48	54
4	SA-E	419	1.7	43	45	44	49
	Y-E	420	2.9	52	53	50	52
	Y-C	440	0	54	64	59	55
6	SA-E	464	2.1	45	39	39	40
	Y-E	480	3.5	59	47	45	51
	Y-C	454	0	55	57	48	49
7	SA-E	467	3.2	50	37	43	44
	Y-E	389	7.2	50	38	37	40
	Y-C	446	0	46	57	56	58
8	SA-E	366	0.6	61	57	56	55
	Y-E	438	0.5	57	57	56	56
	Y-C	435	0	49	54	55	55
9	SA-E	423	4.2	51	61	61	63
	Y-E	347	8.3	55	56	57	57
	Y-C	484	0	53	57	63	52
10	SA-E	343	3.7	56	37	41	40
	Y-E	406	4.3	50	47	44	45
	Y-C	447	0	53	58	54	55
11	SA-E	388	4.4	56	50	50	50
	Y-E	430	7	51	43	37	43
	Y-C	445	0	50	53	51	51
14	SA-E	439	0.9	54	52	45	57
	Y-E	428	1.2	52	57	53	53
	Y-C	398	0	55	60	57	60
15	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
16	SA-E	347	1.9	49	58	54	56
	Y-E	365	2.4	53	52	49	45
	Y-C	401	0	53	45	50	57
17	SA-E	372	0.2	52	63	56	60
	Y-E	409	0.3	50	50	54	54
	Y-C	387	0	56	50	57	52

19	SA-E	323	1.4	56	55	57	50
	Y-E	355	2	56	50	50	47
	Y-C	393	0	60	59	58	63
20	SA-E	373	5.6	54	39	35	42
	Y-E	384	8.6	52	35	35	27
	Y-C	378	0	55	52	52	59
21	SA-E	365	0.7	49	49	55	56
	Y-E	362	1.1	57	65	60	65
	Y-C	425	0	54	49	55	55
22	SA-E	372	4.6	49	36	36	38
	Y-E	397	6.5	56	36	49	43
	Y-C	356	0	53	59	57	50
24	SA-E	419	4.6	45	32	44	34
	Y-E	338	7	42	29	23	35
	Y-C	435	0	38	50	55	52
25	SA-E	358	0.4	45	55	46	52
	Y-E	426	0.7	46	52	48	51
	Y-C	406	0	46	47	44	46
26	SA-E	390	0.4	45	52	42	52
	Y-E	384	0.5	55	45	55	50
	Y-C	378	0	42	48	46	46
27	SA-E	392	0.1	57	50	60	52
	Y-E	400	0.5	44	44	46	45
	Y-C	423	0	54	59	62	54
28	SA-E	378	0.5	40	45	56	50
	Y-E	377	0.7	43	41	42	49
	Y-C	375	0	53	56	58	62
31	SA-E	394	0	45	49	45	50
	Y-E	358	0.4	52	49	53	50
	Y-C	408	0	44	49	50	54
32	SA-E	395	0.2	40	60	49	48
	Y-E	418	1	45	39	45	45
	Y-C	359	0	54	64	58	56
33	SA-E	384	0.3	56	57	50	56
	Y-E	403	0.3	45	48	52	49
	Y-C	450	0	53	56	66	56
34	SA-E	462	1.9	50	53	52	54
	Y-E	408	3.4	52	46	43	48
	Y-C	403	0	50	51	50	54
35	SA-E	416	0.2	45	49	56	55
	Y-E	420	0.4	45	59	48	58
	Y-C	435	0	58	53	52	61

36	SA-E	433	3.1	50	50	53	57
	Y-E	410	5.6	48	40	41	41
	Y-C	381	0	51	48	49	51
37	SA-E	392	0	54	52	56	50
	Y-E	405	0.4	56	50	40	50
	Y-C	414	0	44	50	45	52
38	SA-E	389	1.6	42	47	54	46
	Y-E	435	2.9	51	48	52	48
	Y-C	380	0	41	47	42	46
39	SA-E	414	0.3	50	48	54	55
	Y-E	374	1.2	49	48	55	53
	Y-C	384	0	53	52	46	53
40	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
41	SA-E	439	4.6	38	35	32	33
	Y-E	369	8	44	29	25	31
	Y-C	413	0	50	50	49	51
42	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
43	SA-E	353	3.5	45	48	49	46
	Y-E	354	3.1	56	47	44	48
	Y-C	467	0	55	52	45	52
44	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
46	SA-E	376	1.8	48	48	45	53
	Y-E	397	4.3	49	48	50	50
	Y-C	414	0	48	54	52	50
47	SA-E	414	2.1	50	45	40	49
	Y-E	369	3.3	59	48	64	54
	Y-C	430	0	53	58	50	51

Experiment 3
Session 7

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	404	1.9	53	46	51	54
	Y-E	400	3.3	49	44	44	39
	Y-C	420	0	48	49	50	53
3	SA-E	396	4.7	41	38	34	37
	Y-E	398	3.7	47	37	37	38
	Y-C	416	0	55	55	54	55
4	SA-E	414	4.9	44	34	40	39
	Y-E	421	7.7	59	24	26	28
	Y-C	435	0	52	58	62	58
6	SA-E	464	4.7	51	34	36	34
	Y-E	477	8	60	26	23	29
	Y-C	446	0	48	58	52	48
7	SA-E	460	2.2	50	49	48	50
	Y-E	382	4	53	49	48	49
	Y-C	447	0	56	56	50	48
8	SA-E	372	3.1	56	44	48	47
	Y-E	435	3.8	55	65	58	54
	Y-C	437	0	50	54	45	49
9	SA-E	428	3.9	54	49	53	45
	Y-E	346	7.8	50	43	42	45
	Y-C	484	0	50	56	52	52
10	SA-E	340	1.3	49	47	54	51
	Y-E	403	1.5	52	43	50	46
	Y-C	446	0	54	64	58	54
11	SA-E	390	3.7	49	43	43	46
	Y-E	429	4.1	46	46	41	41
	Y-C	446	0	45	53	54	55
14	SA-E	440	0.4	52	57	58	54
	Y-E	430	0.7	54	49	42	44
	Y-C	400	0	53	53	57	57
15	SA-E	376	3	55	49	52	46
	Y-E	361	3.2	55	51	51	58
	Y-C	363	0	52	58	54	55
16	SA-E	344	2.7	51	59	52	49
	Y-E	360	6.6	44	34	39	30
	Y-C	397	0	58	54	64	59
17	SA-E	372	4.1	56	54	64	49
	Y-E	410	3.5	53	44	46	42
	Y-C	380	0	55	51	65	55

19	SA-E	338	2.5	55	53	47	42
	Y-E	356	3.4	53	52	46	39
	Y-C	392	0	62	57	65	61
20	SA-E	383	4.4	55	34	33	35
	Y-E	390	8.9	54	31	30	30
	Y-C	377	0	58	46	54	50
21	SA-E	370	1.7	53	51	51	54
	Y-E	356	2.2	69	54	56	67
	Y-C	421	0	47	53	50	46
22	SA-E	365	1.1	50	56	53	47
	Y-E	399	1.2	62	57	57	65
	Y-C	357	0	55	56	58	61
24	SA-E	415	5	46	33	29	30
	Y-E	336	7	46	35	28	30
	Y-C	423	0	43	50	45	45
25	SA-E	351	4.3	39	29	29	28
	Y-E	414	6	45	29	28	29
	Y-C	397	0	43	46	44	42
26	SA-E	381	2.1	39	38	45	34
	Y-E	381	2.7	51	36	40	40
	Y-C	369	0	39	44	41	39
27	SA-E	384	0.6	51	50	46	51
	Y-E	392	0.8	42	45	41	40
	Y-C	416	0	53	53	58	58
28	SA-E	375	0.5	52	56	57	45
	Y-E	368	0.7	44	40	40	47
	Y-C	371	0	56	60	60	52
31	SA-E	392	0.7	33	41	40	44
	Y-E	352	0.6	52	50	53	55
	Y-C	392	0	45	45	45	51
32	SA-E	382	0.2	50	45	43	52
	Y-E	403	0.3	53	46	43	48
	Y-C	350	0	48	47	57	52
33	SA-E	374	0.5	51	53	53	58
	Y-E	391	1	40	49	48	45
	Y-C	436	0	47	57	54	58
34	SA-E	448	3.5	55	54	54	50
	Y-E	399	5.6	43	25	26	29
	Y-C	391	0	46	47	48	45
35	SA-E	403	3.3	54	41	46	36
	Y-E	407	6.6	47	25	33	29
	Y-C	421	0	61	52	60	54

36	SA-E	422	1.9	47	52	58	54
	Y-E	400	3.3	45	40	39	43
	Y-C	365	0	41	48	49	42
37	SA-E	382	0.5	47	58	54	62
	Y-E	392	1.1	55	52	55	55
	Y-C	406	0	46	51	54	47
38	SA-E	376	3.5	43	49	40	46
	Y-E	422	5.9	55	39	44	34
	Y-C	369	0	39	44	45	40
39	SA-E	402	0.3	45	44	44	59
	Y-E	366	0.6	40	52	48	56
	Y-C	374	0	40	50	58	53
40	SA-E	426	4.3	45	43	30	38
	Y-E	393	8.3	48	28	30	27
	Y-C	368	0	54	57	48	50
41	SA-E	433	0.5	47	47	43	47
	Y-E	356	0.9	52	48	44	51
	Y-C	402	0	50	48	47	44
42	SA-E	377	3.6	48	54	50	48
	Y-E	391	9	50	25	25	27
	Y-C	373	0	55	54	58	59
43	SA-E	344	1.9	48	42	45	40
	Y-E	342	3	48	40	39	44
	Y-C	460	0	45	40	38	48
44	SA-E	396	3.5	46	35	38	36
	Y-E	387	7.7	50	25	27	27
	Y-C	328	0	48	45	48	40
46	SA-E	370	3.2	48	55	45	53
	Y-E	384	3.8	45	53	44	52
	Y-C	404	0	50	49	53	48
47	SA-E	402	2	49	35	40	45
	Y-E	365	5.8	55	43	35	40
	Y-C	409	0	48	52	44	50

Experiment 3
Session 8

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	398	4.4	49	46	47	38
	Y-E	393	7.6	46	45	42	40
	Y-C	412	0	47	49	51	46
3	SA-E	388	1.2	50	50	45	43
	Y-E	393	1.8	42	41	41	36
	Y-C	412	0	50	50	54	53
4	SA-E	405	0.5	50	44	44	39
	Y-E	413	1.1	53	59	56	44
	Y-C	432	0	49	59	62	58
6	SA-E	462	3.1	50	35	36	36
	Y-E	463	3	50	35	27	28
	Y-C	440	0	42	51	44	49
7	SA-E	453	4.6	49	45	39	45
	Y-E	376	7.2	47	44	39	39
	Y-C	436	0	54	56	51	54
8	SA-E	365	5.4	58	41	38	40
	Y-E	430	6.1	57	45	39	50
	Y-C	431	0	52	48	52	48
9	SA-E	416	5.4	58	43	42	42
	Y-E	343	7.3	58	31	40	29
	Y-C	476	0	54	54	61	54
10	SA-E	332	3.4	54	46	53	49
	Y-E	394	3.9	49	45	52	53
	Y-C	438	0	59	54	54	55
11	SA-E	380	4.8	45	40	47	46
	Y-E	420	6.2	49	39	46	40
	Y-C	432	0	56	55	50	52
14	SA-E	429	3.8	54	45	38	40
	Y-E	414	5.9	58	32	38	40
	Y-C	389	0	56	56	60	65
15	SA-E	375	2.9	50	47	45	44
	Y-E	359	3.1	54	53	55	55
	Y-C	365	0	51	53	52	52
16	SA-E	345	0	53	53	55	55
	Y-E	355	7.3	49	34	45	48
	Y-C	398	0	54	55	54	50
17	SA-E	374	0.8	65	55	61	56
	Y-E	408	1	50	51	54	56
	Y-C	383	0	60	57	55	56

19	SA-E	339	3.6	51	45	46	44
	Y-E	353	5	52	50	48	40
	Y-C	392	0	46	51	50	59
20	SA-E	379	3.8	51	51	50	52
	Y-E	387	4.8	56	45	54	48
	Y-C	378	0	55	53	55	49
21	SA-E	370	3.1	56	50	64	54
	Y-E	357	3.3	60	65	56	54
	Y-C	425	0	51	59	52	52
22	SA-E	362	0.9	50	53	55	46
	Y-E	395	1.1	53	61	62	56
	Y-C	350	0	49	52	50	52
24	SA-E	409	3.7	42	35	37	42
	Y-E	334	4.9	39	35	35	40
	Y-C	424	0	35	46	50	45
25	SA-E	349	0.5	43	47	50	43
	Y-E	408	1.3	46	41	44	44
	Y-C	389	0	40	38	36	44
26	SA-E	379	0.7	41	33	50	50
	Y-E	382	1.2	45	48	50	47
	Y-C	366	0	40	46	41	45
27	SA-E	385	0.8	48	50	51	45
	Y-E	396	1.6	50	40	46	41
	Y-C	413	0	52	50	51	55
28	SA-E	373	0.6	55	54	49	55
	Y-E	366	0.8	57	47	44	50
	Y-C	363	0	62	53	60	56
31	SA-E	398	1.2	49	50	54	47
	Y-E	351	1.2	54	48	45	45
	Y-C	390	0	44	55	50	52
32	SA-E	374	2.7	36	30	32	35
	Y-E	399	3.3	38	36	34	39
	Y-C	344	0	39	56	54	53
33	SA-E	368	1.2	38	44	45	40
	Y-E	386	2.6	40	41	50	39
	Y-C	434	0	50	50	53	56
34	SA-E	444	1.8	50	53	44	44
	Y-E	392	2	48	44	42	39
	Y-C	394	0	60	54	60	63
35	SA-E	396	0.5	46	53	43	56
	Y-E	400	1	55	50	46	45
	Y-C	413	0	49	52	55	55

36	SA-E	424	5.9	60	31	35	30
	Y-E	392	8.3	40	26	24	24
	Y-C	355	0	40	44	40	43
37	SA-E	374	0.2	60	52	55	55
	Y-E	385	1	49	46	43	53
	Y-C	400	0	43	54	50	55
38	SA-E	374	6.1	40	37	34	26
	Y-E	409	8.9	50	27	29	24
	Y-C	367	0	40	36	39	41
39	SA-E	392	0.2	47	52	46	51
	Y-E	359	1	44	44	43	40
	Y-C	370	0	40	56	50	50
40	SA-E	422	2	50	44	40	40
	Y-E	390	3.5	40	48	50	43
	Y-C	368	0	50	50	52	54
41	SA-E	432	3.2	40	35	35	35
	Y-E	355	6.8	40	33	29	30
	Y-C	406	0	43	46	44	45
42	SA-E	378	1.6	49	54	52	56
	Y-E	385	3	49	44	44	47
	Y-C	370	0	55	52	50	52
43	SA-E	343	3.3	49	48	44	46
	Y-E	343	7.3	48	30	30	33
	Y-C	461	0	45	43	40	44
44	SA-E	401	2.2	44	45	54	45
	Y-E	385	4.1	52	44	45	35
	Y-C	329	0	48	49	46	45
46	SA-E	370	1.6	45	45	46	52
	Y-E	383	2.9	49	54	40	44
	Y-C	406	0	48	49	45	53
47	SA-E	403	1.2	51	47	40	48
	Y-E	360	2.9	55	47	33	43
	Y-C	424	0	53	44	37	50

Experiment 3
Session 9

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	393	2.6	48	54	54	55
	Y-E	388	5	40	30	38	43
	Y-C	410	0	58	53	52	45
3	SA-E	388	2.8	45	42	45	40
	Y-E	397	4	40	37	40	36
	Y-C	407	0	49	48	50	49
4	SA-E	407	0.8	40	43	40	45
	Y-E	407	1.6	58	51	48	49
	Y-C	433	0	55	54	54	52
6	SA-E	461	3.9	45	40	41	42
	Y-E	464	7.5	45	28	28	28
	Y-C	423	0	58	53	50	51
7	SA-E	452	3.1	53	46	49	53
	Y-E	373	4.1	46	44	49	45
	Y-C	438	0	48	59	59	52
8	SA-E	362	1.2	49	55	60	62
	Y-E	418	1.6	55	50	53	62
	Y-C	422	0	47	53	56	58
9	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
10	SA-E	331	3	48	47	53	52
	Y-E	392	3.9	48	37	49	51
	Y-C	435	0	61	55	53	64
11	SA-E	385	3.5	46	48	48	47
	Y-E	426	6.1	51	44	45	38
	Y-C	430	0	60	62	54	48
14	SA-E	432	0.6	47	57	59	55
	Y-E	410	0.8	57	46	51	55
	Y-C	390	0	48	60	64	63
15	SA-E	378	3.6	46	40	45	42
	Y-E	363	4.9	44	56	55	50
	Y-C	363	0	50	50	55	57
16	SA-E	347	4.2	55	48	50	60
	Y-E	353	5.9	50	40	50	41
	Y-C	402	0	53	51	60	56
17	SA-E	376	3.4	53	44	50	56
	Y-E	414	2.8	50	50	50	48
	Y-C	379	0	63	51	58	60

19	SA-E	338	1.6	55	55	58	47
	Y-E	354	1.9	54	49	48	44
	Y-C	402	0	62	65	59	63
20	SA-E	379	1.7	51	49	49	47
	Y-E	387	3.2	58	48	55	55
	Y-C	380	0	51	54	54	52
21	SA-E	369	3.2	54	56	50	55
	Y-E	361	5.4	60	65	62	55
	Y-C	421	0	45	43	49	53
22	SA-E	368	1.5	45	53	57	50
	Y-E	390	0	50	60	60	69
	Y-C	351	0	44	55	55	50
24	SA-E	409	4.2	53	52	48	50
	Y-E	331	5.3	46	39	42	43
	Y-C	424	0	50	47	52	56
25	SA-E	352	0.3	50	55	52	52
	Y-E	419	0.8	55	46	55	59
	Y-C	388	0	40	45	47	53
26	SA-E	377	1	44	47	46	49
	Y-E	384	1.9	59	40	40	39
	Y-C	368	0	42	46	46	46
27	SA-E	384	2.4	58	53	48	58
	Y-E	396	2.7	47	41	41	41
	Y-C	415	0	52	52	60	57
28	SA-E	371	0.6	55	49	60	60
	Y-E	366	0.9	61	45	49	45
	Y-C	356	0	57	64	55	54
31	SA-E	394	0.3	43	52	42	51
	Y-E	353	0.5	53	50	45	50
	Y-C	387	0	40	51	55	58
32	SA-E	374	1.1	38	44	39	49
	Y-E	398	1.2	40	43	38	39
	Y-C	334	0	58	52	54	49
33	SA-E	369	1	44	54	48	49
	Y-E	388	3.3	48	39	38	42
	Y-C	432	0	45	50	54	52
34	SA-E	446	4.7	49	29	25	26
	Y-E	393	8.9	42	20	24	20
	Y-C	391	0	54	44	60	51
35	SA-E	399	4.9	42	34	40	26
	Y-E	401	10.5	44	25	24	20
	Y-C	414	0	45	42	47	45

36	SA-E	410	3.5	57	37	53	47
	Y-E	376	4.8	47	40	38	37
	Y-C	352	0	47	40	49	44
37	SA-E	377	0.4	58	57	64	54
	Y-E	386	0.8	58	50	53	48
	Y-C	396	0	47	45	45	48
38	SA-E	363	0.3	48	50	42	46
	Y-E	399	0.4	54	40	54	53
	Y-C	372	0	40	40	38	40
39	SA-E	390	0.4	38	47	43	46
	Y-E	360	0.9	50	47	44	48
	Y-C	370	0	49	55	50	50
40	SA-E	423	4.6	50	35	33	34
	Y-E	389	8.4	46	36	35	35
	Y-C	369	0	54	52	45	52
41	SA-E	431	1.9	39	39	40	42
	Y-E	354	3.8	50	44	35	44
	Y-C	409	0	45	50	48	49
42	SA-E	377	0.6	51	46	52	53
	Y-E	385	0.6	51	50	44	45
	Y-C	371	0	54	54	52	45
43	SA-E	346	1.1	51	50	54	50
	Y-E	339	1.8	54	45	50	46
	Y-C	462	0	49	43	40	42
44	SA-E	403	4.4	36	40	36	34
	Y-E	383	7.7	50	23	26	23
	Y-C	333	0	44	40	48	44
46	SA-E	370	3.4	40	30	40	39
	Y-E	379	6.2	44	34	25	31
	Y-C	410	0	44	48	48	52
47	SA-E	403	2.7	45	35	40	39
	Y-E	358	5.9	50	34	31	29
	Y-C	425	0	49	50	49	52

Experiment 3
Session 10

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	393	4.6	48	44	39	40
	Y-E	384	6.2	44	39	44	42
	Y-C	407	0	45	52	52	48
3	SA-E	383	4.1	40	38	34	34
	Y-E	398	5.6	48	49	44	43
	Y-C	413	0	53	49	47	52
4	SA-E	408	2.6	44	36	41	42
	Y-E	406	4.9	59	47	44	44
	Y-C	433	0	58	49	51	56
6	SA-E	467	2.3	48	37	43	46
	Y-E	459	4.7	51	43	38	43
	Y-C	427	0	48	53	51	49
7	SA-E	453	4.2	51	49	59	54
	Y-E	374	7.4	54	44	48	53
	Y-C	439	0	53	60	57	53
8	SA-E	360	2.8	57	58	57	54
	Y-E	421	4.5	64	53	58	54
	Y-C	426	0	56	50	55	54
9	SA-E	422	3.6	51	53	59	49
	Y-E	337	5.6	54	50	46	44
	Y-C	479	0	51	47	58	49
10	SA-E	330	3.6	58	42	46	47
	Y-E	393	6	58	46	48	49
	Y-C	435	0	56	56	56	57
11	SA-E	382	4.6	44	40	40	37
	Y-E	426	6.7	49	52	46	49
	Y-C	430	0	52	50	56	44
14	SA-E	430	2.4	53	57	56	50
	Y-E	414	3.8	52	46	48	42
	Y-C	396	0	53	54	55	57
15	SA-E	380	0	45	56	51	56
	Y-E	361	6.7	49	45	40	44
	Y-C	362	0	58	65	59	51
16	SA-E	359	0.4	60	52	55	54
	Y-E	355	2.4	54	44	49	52
	Y-C	399	0	52	56	54	61
17	SA-E	378	4	50	56	58	58
	Y-E	415	3.1	53	55	54	51
	Y-C	379	0	59	64	60	63

19	SA-E	339	2.9	53	55	52	54
	Y-E	353	3.8	53	50	46	51
	Y-C	399	0	64	56	69	65
20	SA-E	383	1.2	53	50	58	49
	Y-E	390	2.2	53	52	53	56
	Y-C	382	0	52	55	55	59
21	SA-E	368	5.4	51	52	62	41
	Y-E	362	0	63	62	58	55
	Y-C	427	0	51	49	48	50
22	SA-E	365	0.6	51	48	44	46
	Y-E	391	1	53	52	55	48
	Y-C	353	0	49	49	50	49
24	SA-E	414	5.1	46	45	43	46
	Y-E	337	9.5	43	24	23	28
	Y-C	427	0	37	52	55	50
25	SA-E	356	0.6	35	40	42	36
	Y-E	419	0.8	43	39	36	39
	Y-C	394	0	33	41	41	43
26	SA-E	380	0.6	40	42	42	43
	Y-E	386	0.8	46	38	46	41
	Y-C	372	0	37	42	41	40
27	SA-E	386	1.7	48	45	42	46
	Y-E	400	2.2	41	37	35	36
	Y-C	417	0	45	46	48	57
28	SA-E	374	3.2	50	50	40	40
	Y-E	370	3.3	56	49	40	38
	Y-C	353	0	52	54	58	58
31	SA-E	391	6	47	29	24	27
	Y-E	355	7.9	57	27	24	24
	Y-C	396	0	48	53	51	46
32	SA-E	377	3.1	45	42	43	43
	Y-E	398	3.6	42	43	50	39
	Y-C	331	0	54	44	50	40
33	SA-E	374	4.2	48	43	50	43
	Y-E	392	5.8	55	35	38	40
	Y-C	437	0	44	55	57	56
34	SA-E	441	4.7	45	24	29	33
	Y-E	384	5.5	39	35	40	38
	Y-C	393	0	51	55	55	49
35	SA-E	404	1.1	44	48	44	50
	Y-E	392	1.3	44	60	56	51
	Y-C	415	0	40	48	58	57

36	SA-E	410	5.3	48	34	34	35
	Y-E	377	8.7	44	38	46	44
	Y-C	354	0	43	44	49	52
37	SA-E	376	1.4	58	53	51	54
	Y-E	392	1.8	56	45	54	44
	Y-C	395	0	43	40	44	40
38	SA-E	366	0.2	50	48	50	53
	Y-E	406	0.4	45	48	46	59
	Y-C	373	0	43	39	40	43
39	SA-E	398	0.4	47	61	58	64
	Y-E	364	0.4	54	50	46	56
	Y-C	367	0	49	50	54	50
40	SA-E	422	3	40	34	36	38
	Y-E	391	5.3	46	45	39	40
	Y-C	372	0	54	47	50	44
41	SA-E	429	2.1	38	39	39	40
	Y-E	353	7.4	47	23	26	24
	Y-C	412	0	47	44	44	58
42	SA-E	376	2.1	53	43	45	43
	Y-E	387	3.6	48	40	44	47
	Y-C	381	0	48	51	49	48
43	SA-E	348	1.9	55	41	44	39
	Y-E	342	8.4	51	29	25	26
	Y-C	464	0	43	53	49	43
44	SA-E	409	2.7	38	32	38	40
	Y-E	381	4.5	43	36	36	35
	Y-C	334	0	49	48	44	46
46	SA-E	368	1.2	48	51	42	47
	Y-E	374	2.3	49	44	45	47
	Y-C	407	0	49	47	47	47
47	SA-E	401	2.2	49	39	34	43
	Y-E	357	3.8	54	35	34	36
	Y-C	430	0	44	45	43	47

Experiment 3
Session 11

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	398	0.8	47	57	50	54
	Y-E	383	1.8	38	44	50	40
	Y-C	432	0	52	54	54	54
3	SA-E	387	3.3	38	34	35	33
	Y-E	399	7.5	46	35	32	29
	Y-C	414	0	54	54	50	50
4	SA-E	406	0.3	37	41	43	44
	Y-E	407	1.1	51	50	55	54
	Y-C	428	0	54	51	60	54
6	SA-E	465	1.4	48	45	45	44
	Y-E	457	3.1	55	49	50	46
	Y-C	429	0	46	44	47	49
7	SA-E	460	4.4	53	54	48	52
	Y-E	374	7.1	49	42	38	43
	Y-C	447	0	54	53	46	56
8	SA-E	366	1.6	55	57	62	55
	Y-E	419	2.8	57	52	49	50
	Y-C	434	0	52	47	55	52
9	SA-E	425	4	57	49	50	52
	Y-E	342	7	52	39	41	44
	Y-C	484	0	57	53	56	54
10	SA-E	331	0	51	52	54	52
	Y-E	389	7.4	51	38	40	41
	Y-C	434	0	55	47	50	54
11	SA-E	388	3.8	42	50	46	45
	Y-E	425	5.9	48	53	45	46
	Y-C	413	0	46	62	58	62
14	SA-E	434	2.6	47	54	54	58
	Y-E	418	4.4	50	50	50	41
	Y-C	405	0	44	56	57	62
15	SA-E	380	4.5	47	28	33	33
	Y-E	358	6.7	50	45	44	41
	Y-C	362	0	46	43	47	44
16	SA-E	353	2.8	48	59	62	50
	Y-E	350	6.2	47	38	38	39
	Y-C	397	0	50	56	56	51
17	SA-E	377	0.1	55	52	64	60
	Y-E	413	2	50	44	46	41
	Y-C	376	0	55	55	63	60

19	SA-E	340	0.3	44	49	54	45
	Y-E	355	1.2	55	50	53	46
	Y-C	399	0	59	56	56	58
20	SA-E	386	4.2	50	40	40	44
	Y-E	394	8.7	55	28	32	34
	Y-C	379	0	48	50	51	45
21	SA-E	348	4.6	49	34	30	34
	Y-E	361	7.4	57	34	32	44
	Y-C	425	0	49	42	44	44
22	SA-E	366	3.2	54	44	40	45
	Y-E	396	4.7	48	36	36	44
	Y-C	359	0	44	53	46	48
24	SA-E	425	5.8	50	52	46	55
	Y-E	364	9.2	49	37	33	30
	Y-C	421	0	39	49	52	48
25	SA-E	353	0.7	42	46	47	42
	Y-E	413	0.8	43	45	45	47
	Y-C	393	0	39	47	43	47
26	SA-E	379	0.3	39	42	44	43
	Y-E	385	0.5	53	51	50	61
	Y-C	369	0	38	44	40	46
27	SA-E	384	0.3	46	62	45	47
	Y-E	402	0.4	42	43	43	56
	Y-C	416	0	54	57	58	57
28	SA-E	379	0.4	55	44	56	43
	Y-E	367	0.3	52	41	46	47
	Y-C	352	0	58	57	53	59
31	SA-E	387	0.6	49	44	47	40
	Y-E	351	0.8	65	53	45	62
	Y-C	398	0	47	48	50	53
32	SA-E	377	0.2	40	44	40	38
	Y-E	396	0.5	43	43	38	35
	Y-C	332	0	50	49	48	54
33	SA-E	371	0.3	40	50	43	48
	Y-E	389	0.3	45	43	43	47
	Y-C	440	0	50	50	52	52
34	SA-E	443	2.4	45	36	35	40
	Y-E	387	9.5	40	26	25	23
	Y-C	391	0	45	41	45	58
35	SA-E	397	2.2	49	48	45	40
	Y-E	384	3.4	50	42	45	43
	Y-C	414	0	44	47	50	50

36	SA-E	405	2.8	50	43	50	50
	Y-E	379	4.8	41	39	40	40
	Y-C	360	0	41	49	55	53
37	SA-E	376	1	52	50	57	54
	Y-E	395	1.5	55	48	45	50
	Y-C	389	0	42	51	46	44
38	SA-E	367	1.7	45	45	45	53
	Y-E	408	3.1	48	44	44	45
	Y-C	370	0	44	36	44	40
39	SA-E	393	0.2	41	48	48	44
	Y-E	361	0.4	44	47	50	45
	Y-C	362	0	43	45	40	49
40	SA-E	425	1.9	46	40	48	47
	Y-E	395	3.6	49	50	44	40
	Y-C	373	0	45	50	47	55
41	SA-E	436	0.1	37	41	42	41
	Y-E	352	0.3	43	43	44	39
	Y-C	413	0	39	44	45	44
42	SA-E	379	2.2	50	49	43	48
	Y-E	387	3.6	49	40	41	40
	Y-C	380	0	45	44	42	50
43	SA-E	352	1	48	34	40	44
	Y-E	336	1.8	44	45	43	47
	Y-C	474	0	43	46	40	39
44	SA-E	418	4.1	35	38	38	42
	Y-E	382	6.6	50	29	25	24
	Y-C	342	0	41	40	43	43
46	SA-E	374	2.9	44	38	41	45
	Y-E	380	5.2	53	40	34	50
	Y-C	416	0	48	46	46	50
47	SA-E	407	4.5	45	30	27	36
	Y-E	359	8	41	25	23	23
	Y-C	433	0	45	43	48	47

Experiment 3
Session 12

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	395	0.4	53	58	58	50
	Y-E	387	1.1	36	44	41	45
	Y-C	421	0	49	49	53	56
3	SA-E	394	2.3	36	34	36	35
	Y-E	398	3.1	42	40	42	39
	Y-C	418	0	44	40	48	43
4	SA-E	412	0.5	40	40	44	38
	Y-E	408	1.2	42	45	53	48
	Y-C	433	0	52	52	48	54
6	SA-E	472	2.6	47	37	38	37
	Y-E	465	6	53	35	35	36
	Y-C	435	0	46	44	46	45
7	SA-E	465	2.4	50	57	53	56
	Y-E	378	4.3	50	50	48	53
	Y-C	453	0	43	54	53	56
8	SA-E	369	3.5	56	55	55	55
	Y-E	422	5.5	57	46	52	49
	Y-C	436	0	57	60	54	53
9	SA-E	450	0	58	50	56	59
	Y-E	341	8.8	57	30	39	40
	Y-C	488	0	54	64	57	54
10	SA-E	336	4.1	55	40	47	52
	Y-E	384	6.9	53	40	41	46
	Y-C	436	0	54	53	67	56
11	SA-E	435	0.2	55	55	57	57
	Y-E	425	0.5	46	52	44	59
	Y-C	422	0	52	57	57	55
14	SA-E	437	5.1	50	46	43	43
	Y-E	427	7.6	51	33	39	41
	Y-C	405	0	61	53	57	60
15	SA-E	378	0.7	42	56	48	52
	Y-E	361	0.1	47	46	44	46
	Y-C	367	0	52	47	54	50
16	SA-E	356	0.2	55	51	50	55
	Y-E	357	0.4	46	45	42	45
	Y-C	401	0	56	56	55	55
17	SA-E	385	2.8	58	45	43	46
	Y-E	413	2	52	46	45	44
	Y-C	384	0	62	67	60	65

19	SA-E	347	2.6	44	45	53	38
	Y-E	359	2.2	49	46	45	41
	Y-C	402	0	59	61	67	52
20	SA-E	390	0.9	54	55	54	55
	Y-E	397	1.9	50	59	55	55
	Y-C	376	0	54	45	52	45
21	SA-E	369	2.6	43	44	38	42
	Y-E	364	1.8	55	66	59	56
	Y-C	429	0	47	49	45	45
22	SA-E	368	0.2	52	55	53	50
	Y-E	400	0.7	40	45	48	47
	Y-C	357	0	45	46	45	49
24	SA-E	423	5.3	50	28	30	26
	Y-E	375	9.3	54	48	40	48
	Y-C	418	0	53	51	49	50
25	SA-E	355	4.1	40	29	29	29
	Y-E	412	6.7	41	32	26	25
	Y-C	393	0	47	46	46	51
26	SA-E	382	6.1	44	30	29	30
	Y-E	386	6.9	58	25	32	24
	Y-C	371	0	42	45	44	43
27	SA-E	387	5.5	50	28	30	34
	Y-E	405	6.8	48	28	30	34
	Y-C	414	0	56	54	60	60
28	SA-E	380	4.2	45	48	42	43
	Y-E	371	4.8	49	38	39	53
	Y-C	356	0	63	54	64	67
31	SA-E	387	3.1	48	46	42	35
	Y-E	353	4.8	55	40	39	39
	Y-C	392	0	54	59	60	57
32	SA-E	377	0.3	43	42	45	48
	Y-E	397	0.3	34	44	38	38
	Y-C	332	0	49	44	42	44
33	SA-E	368	0.8	44	45	39	44
	Y-E	388	1.2	54	43	47	41
	Y-C	438	0	47	48	47	53
34	SA-E	444	3.7	50	37	38	38
	Y-E	383	6	43	30	34	31
	Y-C	387	0	44	45	44	46
35	SA-E	404	3.9	44	35	40	40
	Y-E	388	6	40	27	30	34
	Y-C	414	0	43	47	53	49

36	SA-E	411	3.1	53	41	47	49
	Y-E	381	5.2	41	36	35	34
	Y-C	359	0	40	49	47	44
37	SA-E	377	0.5	54	53	53	53
	Y-E	395	0.7	53	46	55	57
	Y-C	390	0	48	40	44	47
38	SA-E	364	2.5	44	40	40	40
	Y-E	405	4.1	54	38	39	42
	Y-C	370	0	40	41	42	40
39	SA-E	394	1.4	45	48	46	45
	Y-E	366	2.1	49	45	50	42
	Y-C	360	0	45	44	42	44
40	SA-E	422	4.4	50	34	33	33
	Y-E	397	8.3	44	26	29	34
	Y-C	373	0	45	47	45	50
41	SA-E	440	4.7	39	30	30	28
	Y-E	348	8.7	40	23	22	22
	Y-C	416	0	45	44	47	46
42	SA-E	380	3.4	55	40	35	40
	Y-E	385	6	49	31	26	37
	Y-C	377	0	43	48	48	45
43	SA-E	350	3.3	53	37	36	35
	Y-E	335	5.7	46	26	27	33
	Y-C	469	0	54	40	44	39
44	SA-E	420	1.2	37	35	40	45
	Y-E	382	2.3	40	35	35	40
	Y-C	341	0	49	41	40	54
46	SA-E	370	2.6	41	32	42	44
	Y-E	378	4.7	44	38	33	40
	Y-C	415	0	45	47	46	49
47	SA-E	407	0.7	45	45	47	44
	Y-E	353	1.2	42	45	39	47
	Y-C	433	0	43	49	44	45

Experiment 3
Session 13

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	410	1.9	54	52	55	57
	Y-E	400	0.8	45	44	50	45
	Y-C	429	0	48	55	53	62
3	SA-E	399	5.3	54	39	46	43
	Y-E	402	7.6	47	44	48	47
	Y-C	426	0	54	50	49	51
4	SA-E	427	4.8	49	49	48	45
	Y-E	419	2.2	60	39	35	40
	Y-C	440	0	58	56	55	60
6	SA-E	482	1	45	54	49	48
	Y-E	478	7.1	61	52	44	44
	Y-C	456	0	59	55	52	53
7	SA-E	470	3.5	56	52	46	51
	Y-E	384	4.9	46	46	47	47
	Y-C	454	0	57	52	58	60
8	SA-E	378	3.2	46	56	64	55
	Y-E	422	4.7	53	50	47	60
	Y-C	438	0	45	43	51	50
9	SA-E	431	0.3	46	54	49	51
	Y-E	339	7.8	57	35	35	32
	Y-C	499	0	57	56	57	51
10	SA-E	337	3.9	52	41	46	47
	Y-E	390	5.9	55	46	40	36
	Y-C	445	0	55	55	60	56
11	SA-E	397	4.5	50	43	50	39
	Y-E	425	7.4	53	50	56	45
	Y-C	434	0	55	56	52	57
14	SA-E	438	2.6	50	49	55	49
	Y-E	413	4	49	48	43	54
	Y-C	405	0	54	55	52	62
15	SA-E	375	3.8	41	40	38	43
	Y-E	360	5.9	48	40	40	40
	Y-C	367	0	45	46	46	49
16	SA-E	350	0.3	60	54	57	54
	Y-E	350	0.7	43	45	49	49
	Y-C	397	0	55	54	49	53
17	SA-E	382	3.9	45	37	36	37
	Y-E	410	8.6	48	27	35	30
	Y-C	378	0	67	63	65	63

19	SA-E	342	2.4	46	44	44	46
	Y-E	354	3.9	46	42	47	38
	Y-C	399	0	57	54	56	55
20	SA-E	383	2.1	50	45	45	40
	Y-E	390	5	60	36	39	30
	Y-C	371	0	44	45	53	44
21	SA-E	366	3.5	46	31	39	33
	Y-E	359	5.7	60	35	34	32
	Y-C	433	0	41	40	44	44
22	SA-E	366	1.2	38	40	40	39
	Y-E	395	3	38	41	35	36
	Y-C	355	0	43	57	39	42
24	SA-E	423	4.6	48	46	40	40
	Y-E	344	8.8	47	29	29	27
	Y-C	420	0	39	54	54	44
25	SA-E	353	0.4	42	47	38	40
	Y-E	411	0.7	47	42	43	42
	Y-C	398	0	50	51	55	57
26	SA-E	379	5.1	42	44	42	48
	Y-E	380	8.4	52	26	25	24
	Y-C	373	0	41	44	46	45
27	SA-E	393	0.8	50	53	55	53
	Y-E	410	1.2	62	60	61	58
	Y-C	418	0	53	56	45	55
28	SA-E	379	0.7	62	46	53	57
	Y-E	375	0.7	41	43	57	50
	Y-C	356	0	55	62	55	61
31	SA-E	390	1.4	42	42	47	45
	Y-E	350	2	55	42	40	44
	Y-C	393	0	52	51	59	55
32	SA-E	382	0.2	44	43	44	46
	Y-E	399	0.4	43	40	43	44
	Y-C	334	0	50	47	48	48
33	SA-E	371	0.5	49	44	40	46
	Y-E	394	0.8	50	45	47	48
	Y-C	440	0	46	46	44	47
34	SA-E	447	2.3	45	44	40	44
	Y-E	389	3.5	36	38	30	32
	Y-C	389	0	45	43	42	44
35	SA-E	408	2.9	50	37	38	44
	Y-E	389	4.4	43	39	44	35
	Y-C	420	0	52	43	47	47

36	SA-E	412	2	48	42	40	47
	Y-E	383	2.8	44	40	36	38
	Y-C	360	0	43	39	43	44
37	SA-E	375	0.4	50	48	52	48
	Y-E	403	0.5	54	43	39	46
	Y-C	393	0	43	43	43	48
38	SA-E	369	0.4	48	42	53	44
	Y-E	407	0.6	48	52	43	47
	Y-C	371	0	38	37	35	36
39	SA-E	397	0.8	43	40	44	42
	Y-E	369	1.3	43	44	41	46
	Y-C	367	0	38	48	47	46
40	SA-E	412	1.9	48	30	29	35
	Y-E	399	3.6	43	34	35	39
	Y-C	374	0	42	49	49	45
41	SA-E	436	2	53	35	35	33
	Y-E	364	3	52	54	40	45
	Y-C	412	0	43	44	43	41
42	SA-E	378	4.5	54	39	35	40
	Y-E	380	7.4	45	24	25	23
	Y-C	375	0	47	40	42	45
43	SA-E	353	3.2	45	34	32	32
	Y-E	332	4.6	45	40	37	36
	Y-C	463	0	46	45	43	40
44	SA-E	419	3.5	36	34	26	29
	Y-E	382	6.5	40	23	20	24
	Y-C	338	0	49	50	43	43
46	SA-E	370	4.9	40	39	44	49
	Y-E	376	7.3	45	48	52	50
	Y-C	410	0	49	53	48	49
47	SA-E	403	1.5	49	40	36	40
	Y-E	354	2.2	42	35	45	45
	Y-C	435	0	35	45	50	42

Experiment 3
Session 14

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	404	0.3	57	51	52	56
	Y-E	394	0.5	44	46	48	44
	Y-C	424	0	55	52	60	58
3	SA-E	399	2.5	42	47	50	44
	Y-E	403	3.8	44	48	44	39
	Y-C	421	0	52	49	54	55
4	SA-E	428	1.3	49	46	49	54
	Y-E	418	2.5	60	49	50	60
	Y-C	440	0	55	58	61	63
6	SA-E	483	3.3	54	49	44	45
	Y-E	478	6.8	58	44	44	42
	Y-C	446	0	64	60	56	59
7	SA-E	463	3.9	49	45	50	50
	Y-E	383	4.2	45	52	52	50
	Y-C	454	0	45	53	59	59
8	SA-E	374	2.1	55	58	47	47
	Y-E	427	7.8	54	44	33	36
	Y-C	437	0	55	53	53	53
9	SA-E	432	4.4	54	48	39	46
	Y-E	328	7.6	53	40	41	46
	Y-C	498	0	58	50	54	53
10	SA-E	333	3.3	53	53	50	55
	Y-E	391	5.3	55	51	47	50
	Y-C	441	0	55	55	51	50
11	SA-E	391	4.6	57	57	54	60
	Y-E	425	5.1	49	50	45	54
	Y-C	429	0	52	58	52	56
14	SA-E	436	4.7	47	43	46	48
	Y-E	413	7.4	50	37	41	44
	Y-C	402	0	51	57	59	54
15	SA-E	376	4.1	48	40	33	36
	Y-E	359	7	51	28	25	38
	Y-C	369	0	56	50	55	55
16	SA-E	352	0.8	55	56	58	55
	Y-E	353	0	51	46	51	50
	Y-C	394	0	58	49	50	54
17	SA-E	377	1.9	54	55	55	61
	Y-E	411	3.9	50	47	51	51
	Y-C	382	0	55	65	59	63

19	SA-E	339	2.7	56	52	44	40
	Y-E	351	5	58	52	59	39
	Y-C	396	0	60	59	58	59
20	SA-E	387	3.6	57	50	50	55
	Y-E	390	8.5	54	28	29	29
	Y-C	368	0	52	49	55	50
21	SA-E	366	4.8	52	41	34	38
	Y-E	353	8.4	57	31	28	28
	Y-C	431	0	50	57	45	48
22	SA-E	364	1.8	59	49	53	49
	Y-E	393	4.4	50	42	39	48
	Y-C	355	0	54	50	51	55
24	SA-E	422	0.2	47	50	53	50
	Y-E	342	7.7	42	39	33	38
	Y-C	425	0	36	47	55	47
25	SA-E	352	0.5	40	38	40	39
	Y-E	414	0.8	49	44	52	50
	Y-C	397	0	44	42	37	50
26	SA-E	376	3	43	39	32	36
	Y-E	371	8.5	48	25	23	24
	Y-C	373	0	39	45	43	37
27	SA-E	386	1.2	50	49	57	56
	Y-E	412	1.7	55	54	62	60
	Y-C	416	0	53	56	55	49
28	SA-E	382	3.5	57	58	52	50
	Y-E	375	3.6	46	56	45	45
	Y-C	359	0	50	58	55	58
31	SA-E	395	0.3	43	53	47	47
	Y-E	353	0.2	52	46	43	47
	Y-C	395	0	39	55	55	55
32	SA-E	382	1	42	53	48	50
	Y-E	400	1.7	42	40	37	40
	Y-C	336	0	48	50	56	54
33	SA-E	370	0.6	39	43	47	44
	Y-E	392	2.2	48	42	45	45
	Y-C	441	0	48	53	48	50
34	SA-E	449	4.2	47	39	34	40
	Y-E	388	7.3	39	24	23	23
	Y-C	390	0	40	43	45	45
35	SA-E	409	3.5	52	32	31	31
	Y-E	390	5.8	50	30	29	37
	Y-C	418	0	45	45	50	49

36	SA-E	414	2.9	43	44	44	55
	Y-E	385	4.4	38	30	30	40
	Y-C	362	0	35	42	40	41
37	SA-E	379	0.2	60	48	44	54
	Y-E	395	0.3	50	39	44	51
	Y-C	388	0	47	50	43	50
38	SA-E	366	1.7	44	48	43	44
	Y-E	408	4.5	55	35	39	37
	Y-C	368	0	38	40	39	40
39	SA-E	397	0.3	47	45	43	42
	Y-E	367	0.3	47	40	50	47
	Y-C	368	0	40	52	44	47
40	SA-E	413	1.8	45	39	42	44
	Y-E	401	3.4	42	44	40	40
	Y-C	368	0	49	48	42	53
41	SA-E	436	0.2	40	46	42	42
	Y-E	343	0.4	46	40	38	42
	Y-C	418	0	44	46	44	42
42	SA-E	380	2	54	41	39	44
	Y-E	377	3.8	47	33	39	35
	Y-C	377	0	45	44	45	45
43	SA-E	354	2.8	55	30	29	38
	Y-E	335	4	45	30	36	30
	Y-C	469	0	46	36	36	36
44	SA-E	412	2.2	38	33	40	37
	Y-E	371	4.1	45	37	40	38
	Y-C	335	0	40	41	43	46
46	SA-E	373	0.3	42	50	41	48
	Y-E	378	0.6	54	53	45	52
	Y-C	410	0	47	46	44	45
47	SA-E	403	2.7	45	35	33	35
	Y-E	354	3.3	51	33	34	30
	Y-C	439	0	36	50	49	40

Experiment 3
Session 15

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	402	1.5	58	54	52	54
	Y-E	394	3	46	46	42	44
	Y-C	421	0	47	50	49	55
3	SA-E	395	4	50	42	45	46
	Y-E	403	5.5	58	51	53	54
	Y-C	418	0	54	58	58	59
4	SA-E	429	2	49	49	49	50
	Y-E	417	5	55	46	45	46
	Y-C	436	0	60	59	65	64
6	SA-E	484	1.5	55	49	48	50
	Y-E	478	4.1	58	46	52	50
	Y-C	446	0	64	55	53	57
7	SA-E	472	3	53	50	51	48
	Y-E	390	3.3	45	48	47	50
	Y-C	457	0	58	62	58	60
8	SA-E	379	4.7	53	46	48	48
	Y-E	422	7.8	55	48	45	49
	Y-C	450	0	57	56	50	60
9	SA-E	428	4.6	50	55	54	58
	Y-E	334	5.4	53	53	53	60
	Y-C	504	0	56	56	58	54
10	SA-E	338	3	56	47	52	52
	Y-E	399	5.9	50	36	43	42
	Y-C	447	0	56	54	62	55
11	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
14	SA-E	440	3.1	54	53	50	45
	Y-E	412	1.3	49	52	44	46
	Y-C	402	0	58	62	60	64
15	SA-E	369	0.2	39	49	43	52
	Y-E	348	0.4	42	46	44	48
	Y-C	366	0	50	55	54	47
16	SA-E	351	0.9	49	55	54	48
	Y-E	351	2.3	48	50	50	39
	Y-C	393	0	47	58	53	55
17	SA-E	386	0.7	48	56	56	57
	Y-E	420	1.3	44	44	44	37
	Y-C	386	0	56	56	62	50

19	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
20	SA-E	392	0.7	60	52	44	42
	Y-E	383	1.8	60	52	49	56
	Y-C	372	0	44	43	46	45
21	SA-E	373	1.1	54	50	52	54
	Y-E	350	2.6	53	59	52	59
	Y-C	436	0	38	39	40	43
22	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
24	SA-E	430	1.8	44	46	50	40
	Y-E	340	5.8	48	30	44	43
	Y-C	429	0	35	45	47	45
25	SA-E	360	0.5	40	33	32	33
	Y-E	413	2	45	40	41	52
	Y-C	402	0	43	37	47	40
26	SA-E	387	5.4	41	25	24	26
	Y-E	364	6.9	51	25	24	29
	Y-C	373	0	40	37	42	37
27	SA-E	382	1.3	49	46	40	46
	Y-E	407	1.9	45	45	45	53
	Y-C	409	0	45	54	53	47
28	SA-E	381	0.8	47	56	52	62
	Y-E	376	1.1	45	44	43	51
	Y-C	358	0	57	49	42	52
31	SA-E	398	3.8	50	32	33	32
	Y-E	356	6.6	57	25	25	25
	Y-C	400	0	46	48	46	44
32	SA-E	383	0.3	38	37	35	43
	Y-E	398	0.7	35	36	35	40
	Y-C	344	0	42	49	38	42
33	SA-E	372	2.1	44	37	34	35
	Y-E	399	3.3	43	39	39	40
	Y-C	446	0	45	44	42	49
34	SA-E	352	4.1	45	24	29	31
	Y-E	388	8.4	40	20	19	17
	Y-C	391	0	44	44	44	40
35	SA-E	408	2.5	47	36	40	40
	Y-E	392	4	49	34	33	43
	Y-C	419	0	47	44	45	50

36	SA-E	415	3.8	44	35	38	38
	Y-E	387	6.7	37	25	35	30
	Y-C	365	0	34	40	36	38
37	SA-E	380	0.6	45	40	50	52
	Y-E	398	1	50	38	39	46
	Y-C	385	0	45	40	47	45
38	SA-E	364	1.7	42	49	50	40
	Y-E	406	4.1	40	36	39	40
	Y-C	365	0	35	40	39	34
39	SA-E	396	0.8	40	50	44	40
	Y-E	371	1	45	42	43	40
	Y-C	366	0	53	45	48	47
40	SA-E	412	3.7	37	31	32	28
	Y-E	400	7	39	24	24	26
	Y-C	373	0	38	40	44	45
41	SA-E	437	0.5	36	41	42	47
	Y-E	342	0.7	41	33	35	40
	Y-C	424	0	40	46	40	44
42	SA-E	382	2.5	46	31	41	38
	Y-E	380	4.6	44	33	26	30
	Y-C	380	0	46	41	36	44
43	SA-E	356	0.4	38	35	32	36
	Y-E	339	0.9	41	39	40	41
	Y-C	474	0	39	35	33	37
44	SA-E	417	4.7	35	32	30	30
	Y-E	379	8	44	25	24	26
	Y-C	334	0	43	37	42	44
46	SA-E	373	5	38	26	30	30
	Y-E	379	9.2	43	20	25	22
	Y-C	411	0	40	43	46	41
47	SA-E	404	2.4	45	34	37	31
	Y-E	355	2.9	47	35	35	37
	Y-C	446	0	42	48	44	45

Experiment 3
Session 16

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	414	0.5	48	58	51	60
	Y-E	400	1.6	50	49	46	52
	Y-C	429	0	55	64	49	54
3	SA-E	399	3.6	40	45	41	49
	Y-E	412	3.9	56	48	50	58
	Y-C	427	0	55	56	57	58
4	SA-E	430	1.6	49	45	56	47
	Y-E	421	3.7	60	54	60	52
	Y-C	445	0	62	56	62	59
6	SA-E	488	2.1	55	45	45	50
	Y-E	490	5.4	60	57	45	46
	Y-C	455	0	64	63	64	59
7	SA-E	477	3.7	44	50	52	45
	Y-E	392	3.9	55	55	52	52
	Y-C	466	0	55	58	56	58
8	SA-E	381	4.4	53	49	50	48
	Y-E	425	7.8	53	48	46	51
	Y-C	441	0	47	56	53	54
9	SA-E	433	4.6	48	46	43	44
	Y-E	343	4.7	53	45	45	46
	Y-C	508	0	52	53	53	50
10	SA-E	340	4.1	53	35	54	37
	Y-E	399	6.4	55	36	45	50
	Y-C	451	0	53	56	55	56
11	SA-E	398	4.9	50	45	45	46
	Y-E	430	6.9	50	47	55	43
	Y-C	442	0	58	63	65	63
14	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
15	SA-E	378	1.5	46	45	47	38
	Y-E	350	3.6	46	47	42	40
	Y-C	371	0	43	47	46	45
16	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
17	SA-E	386	0.1	59	56	48	54
	Y-E	417	0.8	40	39	35	43
	Y-C	381	0	59	49	63	57

19	SA-E	344	0.1	43	37	47	40
	Y-E	360	1.2	40	37	34	32
	Y-C	410	0	48	45	43	47
20	SA-E	396	1.6	46	37	36	40
	Y-E	385	2.7	54	32	29	29
	Y-C	376	0	31	39	33	39
21	SA-E	373	2.2	47	40	33	39
	Y-E	342	4.8	58	30	29	30
	Y-C	437	0	33	40	40	42
22	SA-E	373	1.3	38	34	30	43
	Y-E	400	3	39	30	31	34
	Y-C	356	0	37	41	46	46
24	SA-E	430	5.5	42	25	25	28
	Y-E	341	8.8	46	35	38	32
	Y-C	427	0	39	43	51	38
25	SA-E	358	0.6	33	47	33	35
	Y-E	416	1.1	40	37	36	36
	Y-C	398	0	39	48	38	38
26	SA-E	383	4.1	40	25	32	27
	Y-E	371	6.1	47	30	34	30
	Y-C	372	0	34	45	45	42
27	SA-E	385	2.6	56	48	55	47
	Y-E	407	3.9	52	40	39	46
	Y-C	416	0	54	50	52	48
28	SA-E	384	3.3	54	42	33	32
	Y-E	379	4	56	43	36	33
	Y-C	363	0	51	54	53	48
31	SA-E	396	0.3	43	53	53	54
	Y-E	354	0.5	46	45	42	43
	Y-C	397	0	53	55	55	56
32	SA-E	389	0.3	40	40	36	38
	Y-E	402	0.3	35	35	35	35
	Y-C	349	0	45	50	45	50
33	SA-E	378	1.2	42	40	35	44
	Y-E	397	2.5	43	40	44	37
	Y-C	446	0	44	45	43	44
34	SA-E	455	3	46	42	40	34
	Y-E	386	8	38	24	25	23
	Y-C	392	0	39	43	39	40
35	SA-E	411	3.3	47	52	40	35
	Y-E	393	7	45	25	28	28
	Y-C	423	0	50	48	45	50

36	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
37	SA-E	386	2.1	44	35	38	38
	Y-E	404	5.1	50	40	40	40
	Y-C	396	0	44	49	39	50
38	SA-E	368	1.2	40	50	43	48
	Y-E	407	1.1	46	44	42	48
	Y-C	370	0	37	35	35	35
39	SA-E	403	0.7	40	35	35	40
	Y-E	369	1.6	45	40	43	44
	Y-C	369	0	38	40	44	45
40	SA-E	413	2.6	40	37	35	37
	Y-E	397	4.9	39	35	35	37
	Y-C	372	0	40	45	43	40
41	SA-E	435	0.8	36	39	40	39
	Y-E	345	1.1	40	33	35	38
	Y-C	416	0	35	45	46	43
42	SA-E	383	3.5	43	40	33	37
	Y-E	380	6.4	45	30	26	28
	Y-C	376	0	46	40	39	44
43	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
44	SA-E	420	4.6	47	39	38	40
	Y-E	375	7.5	47	22	21	22
	Y-C	341	0	37	38	45	45
46	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
47	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-

Experiment 3
Session 17

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	410	0.9	54	58	64	64
	Y-E	399	2.7	53	50	49	55
	Y-C	428	0	49	44	43	53
3	SA-E	405	2.6	50	48	36	48
	Y-E	415	2.9	50	54	52	52
	Y-C	428	0	55	56	49	49
4	SA-E	436	1.7	46	50	46	50
	Y-E	430	4.8	59	60	52	51
	Y-C	444	0	57	56	57	65
6	SA-E	492	3.7	55	44	46	39
	Y-E	495	8.9	58	48	46	45
	Y-C	459	0	59	56	56	54
7	SA-E	473	3.4	43	40	43	43
	Y-E	387	2.9	48	44	55	43
	Y-C	460	0	55	56	55	53
8	SA-E	377	3.1	50	45	53	48
	Y-E	417	4.9	50	40	43	39
	Y-C	444	0	49	49	45	56
9	SA-E	427	3.8	50	36	34	36
	Y-E	344	4.9	41	38	35	39
	Y-C	506	0	44	45	48	45
10	SA-E	339	3.8	45	38	43	40
	Y-E	398	6.3	53	38	35	40
	Y-C	451	0	56	64	55	57
11	SA-E	395	0.9	47	56	56	58
	Y-E	427	1.8	51	53	45	47
	Y-C	436	0	42	43	44	46
14	SA-E	442	4	53	40	45	36
	Y-E	418	7.3	50	36	34	32
	Y-C	400	0	57	52	48	53
15	SA-E	381	1.1	38	41	43	45
	Y-E	354	2.5	45	44	40	49
	Y-C	376	0	41	44	43	45
16	SA-E	356	5	47	35	30	29
	Y-E	363	5.5	34	19	20	20
	Y-C	400	0	45	46	45	41
17	SA-E	385	4.4	57	33	28	35
	Y-E	417	8.6	43	24	23	24
	Y-C	380	0	67	61	64	59

19	SA-E	344	2.7	35	36	34	34
	Y-E	358	6.4	43	28	25	23
	Y-C	404	0	51	46	45	52
20	SA-E	399	2	44	41	32	33
	Y-E	390	0.1	45	57	45	55
	Y-C	376	0	35	42	40	44
21	SA-E	377	1.2	53	45	43	39
	Y-E	345	2.4	58	43	40	40
	Y-C	446	0	40	39	45	41
22	SA-E	378	0.7	46	55	53	55
	Y-E	401	1	40	41	36	38
	Y-C	359	0	45	49	43	46
24	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
25	SA-E	375	0.4	40	47	43	44
	Y-E	434	0.7	56	50	50	47
	Y-C	414	0	39	45	54	54
26	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
27	SA-E	401	0.6	47	51	53	57
	Y-E	420	0.9	42	43	53	44
	Y-C	428	0	56	54	58	49
28	SA-E	390	0	48	57	48	58
	Y-E	388	1.1	54	56	49	50
	Y-C	376	0	52	52	46	49
31	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
32	SA-E	388	0.7	45	37	45	43
	Y-E	402	1.3	42	35	39	33
	Y-C	349	0	50	44	49	42
33	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
34	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
35	SA-E	413	1.6	40	33	35	39
	Y-E	393	3.6	54	34	42	43
	Y-C	422	0	42	42	45	47

36	SA-E	416	3.4	43	30	31	34
	Y-E	382	6	38	33	26	29
	Y-C	373	0	38	35	45	39
37	SA-E	384	0.3	49	48	48	49
	Y-E	402	0.5	49	45	44	48
	Y-C	393	0	44	43	43	52
38	SA-E	364	2.4	34	38	38	30
	Y-E	708	4	55	53	50	49
	Y-C	367	0	31	36	37	35
39	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
40	SA-E	416	4.7	40	28	25	25
	Y-E	403	7.6	40	22	30	25
	Y-C	376	0	40	46	39	41
41	SA-E	432	4.4	37	39	40	44
	Y-E	349	5.6	42	29	31	25
	Y-C	420	0	36	45	40	43
42	SA-E	387	3.3	46	35	34	38
	Y-E	380	6.5	46	31	26	27
	Y-C	376	0	50	35	41	43
43	SA-E	362	3	42	36	28	32
	Y-E	344	2.9	49	27	30	26
	Y-C	386	0	46	34	37	40
44	SA-E	417	4.5	44	39	40	35
	Y-E	375	7.4	44	25	24	25
	Y-C	339	0	44	43	40	42
46	SA-E	372	0.3	40	38	40	42
	Y-E	372	0.4	53	40	53	45
	Y-C	410	0	37	45	41	38
47	SA-E	407	1.8	40	36	38	36
	Y-E	355	1.9	50	35	35	44
	Y-C	432	0	40	43	50	45

Experiment 3
Session 18

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	411	0.9	58	49	60	54
	Y-E	396	2.7	48	48	44	48
	Y-C	426	0	55	56	56	56
3	SA-E	401	2.3	47	44	51	44
	Y-E	413	3.1	54	48	49	54
	Y-C	428	0	55	54	46	50
4	SA-E	431	3.3	50	43	43	44
	Y-E	427	8.1	57	35	38	42
	Y-C	441	0	58	57	59	64
6	SA-E	493	1.1	53	44	45	47
	Y-E	498	4	54	49	52	46
	Y-C	460	0	61	65	64	61
7	SA-E	477	4.7	47	35	35	40
	Y-E	390	7.9	53	33	48	40
	Y-C	465	0	51	55	58	60
8	SA-E	382	2.5	47	41	49	47
	Y-E	422	3.7	47	43	41	43
	Y-C	450	0	48	52	57	55
9	SA-E	426	3.8	42	37	34	35
	Y-E	348	6.5	46	38	34	35
	Y-C	509	0	41	52	42	45
10	SA-E	343	1.2	43	39	42	41
	Y-E	401	2.2	53	44	50	46
	Y-C	452	0	50	53	50	51
11	SA-E	400	4	48	34	33	29
	Y-E	435	5.4	49	38	35	39
	Y-C	444	0	39	46	41	41
14	SA-E	442	2.1	49	43	43	41
	Y-E	412	2.8	48	52	43	46
	Y-C	410	0	40	45	38	41
15	SA-E	383	1.3	36	35	37	36
	Y-E	357	2.7	45	42	45	37
	Y-C	375	0	40	44	45	42
16	SA-E	365	2.5	45	52	45	45
	Y-E	353	1.6	42	41	39	36
	Y-C	403	0	45	50	44	52
17	SA-E	393	0.3	56	56	59	58
	Y-E	421	0.5	42	45	46	48
	Y-C	394	0	53	61	56	63

19	SA-E	352	0.4	40	43	50	44
	Y-E	360	0.8	44	38	41	42
	Y-C	411	0	51	48	65	59
20	SA-E	408	2.4	40	41	40	38
	Y-E	397	2.9	45	39	38	40
	Y-C	383	0	55	36	45	44
21	SA-E	387	0.1	52	50	55	42
	Y-E	353	6.7	52	35	33	33
	Y-C	452	0	40	39	40	39
22	SA-E	384	0.2	44	44	45	45
	Y-E	405	0.2	49	39	36	37
	Y-C	359	0	46	48	45	43
24	SA-E	421	6.4	47	30	30	29
	Y-E	340	8.7	44	29	21	24
	Y-C	430	0	48	47	50	47
25	SA-E	365	0.8	41	37	38	41
	Y-E	422	2.1	57	37	43	42
	Y-C	418	0	50	47	52	54
26	SA-E	382	5	48	27	33	38
	Y-E	377	5.1	57	37	45	34
	Y-C	369	0	51	42	47	41
27	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
28	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
31	SA-E	405	0.6	60	54	53	56
	Y-E	358	0.8	55	48	47	40
	Y-C	409	0	47	54	55	47
32	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
33	SA-E	376	0.2	43	50	48	45
	Y-E	398	1.5	43	39	44	40
	Y-C	446	0	44	44	37	45
34	SA-E	457	3.5	45	32	28	34
	Y-E	382	6	39	24	25	22
	Y-C	399	0	44	39	37	45
35	SA-E	418	2.4	44	35	35	38
	Y-E	400	8.5	50	30	29	29
	Y-C	429	0	44	38	43	42

36	SA-E	424	4.5	36	40	31	34
	Y-E	383	8	33	20	25	23
	Y-C	378	0	32	34	43	43
37	SA-E	390	0.1	35	38	35	44
	Y-E	408	0.3	45	50	48	50
	Y-C	402	0	40	40	40	48
38	SA-E	-	-	-	-	-	-
	Y-E	-	-	-	-	-	-
	Y-C	-	-	-	-	-	-
39	SA-E	408	0.1	40	49	46	49
	Y-E	372	0.2	44	44	44	38
	Y-C	376	0	30	49	49	45
40	SA-E	412	2.2	38	37	30	36
	Y-E	404	4.2	40	38	35	35
	Y-C	379	0	40	30	36	43
41	SA-E	437	4.6	34	34	24	25
	Y-E	350	5.7	36	26	26	27
	Y-C	426	0	40	40	43	38
42	SA-E	386	4.8	45	30	33	29
	Y-E	378	8.4	42	24	25	24
	Y-C	373	0	34	41	37	42
43	SA-E	366	3.3	37	30	29	29
	Y-E	347	3.1	40	35	36	34
	Y-C	388	0	33	34	32	37
44	SA-E	420	4.4	35	33	31	35
	Y-E	372	8	50	26	23	24
	Y-C	343	0	47	47	47	40
46	SA-E	371	0.3	33	48	40	48
	Y-E	376	0.5	45	54	55	52
	Y-C	407	0	38	50	37	37
47	SA-E	408	4.9	42	41	42	45
	Y-E	356	8.5	48	24	23	25
	Y-C	435	0	48	47	50	44

Experiment 3
Session 19

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	414	2.6	54	54	52	46
	Y-E	397	7.4	48	35	36	44
	Y-C	419	0	50	51	47	43
3	SA-E	413	1.6	46	39	48	45
	Y-E	411	4.3	51	49	44	55
	Y-C	427	0	49	54	48	55
4	SA-E	431	1.7	50	45	49	48
	Y-E	423	5.2	62	52	49	51
	Y-C	438	0	54	56	55	52
6	SA-E	483	1.9	50	42	44	49
	Y-E	789	4.2	57	48	48	50
	Y-C	456	0	55	58	59	64
7	SA-E	473	2.9	48	47	48	43
	Y-E	384	3.8	54	49	51	52
	Y-C	466	0	56	60	60	58
8	SA-E	380	0.1	53	60	56	49
	Y-E	423	8.5	50	34	39	36
	Y-C	450	0	56	51	54	49
9	SA-E	422	3.7	51	35	38	35
	Y-E	348	3.9	47	50	45	50
	Y-C	508	0	52	50	55	46
10	SA-E	342	3.3	55	42	39	36
	Y-E	404	4.5	52	47	45	36
	Y-C	454	0	57	54	49	50
11	SA-E	402	4	51	37	38	36
	Y-E	430	3.9	59	52	47	46
	Y-C	445	0	43	52	43	44
14	SA-E	448	4.2	50	31	31	32
	Y-E	418	7.3	55	34	39	32
	Y-C	409	0	59	54	50	45
15	SA-E	392	2.6	39	37	32	37
	Y-E	366	2.5	45	46	47	39
	Y-C	380	0	40	40	44	41
16	SA-E	367	1.2	41	55	45	44
	Y-E	363	1.5	38	37	40	40
	Y-C	410	0	48	43	41	45
17	SA-E	396	0.9	56	60	55	54
	Y-E	426	1	44	45	42	40
	Y-C	393	0	61	60	59	56

19	SA-E	350	0.7	38	47	43	48
	Y-E	363	0.7	41	36	41	39
	Y-C	410	0	50	50	53	52
20	SA-E	410	0.7	46	51	42	45
	Y-E	399	1	45	49	54	55
	Y-C	381	0	43	45	38	44
21	SA-E	387	2.3	47	40	38	37
	Y-E	357	4	51	40	38	38
	Y-C	353	0	34	42	44	43
22	SA-E	383	0.2	45	56	45	55
	Y-E	408	0.2	45	46	50	40
	Y-C	362	0	45	48	52	44
24	SA-E	436	2.4	57	45	52	49
	Y-E	350	8.3	45	33	29	28
	Y-C	449	0	41	51	50	56
25	SA-E	383	1	44	44	43	43
	Y-E	440	1.4	44	48	40	40
	Y-C	386	0	40	51	54	48
26	SA-E	397	0.3	55	45	49	50
	Y-E	392	0.4	54	59	62	50
	Y-C	387	0	45	52	52	50
27	SA-E	403	0.3	50	55	53	48
	Y-E	411	0.4	51	44	45	45
	Y-C	437	0	55	60	57	61
28	SA-E	393	1.8	57	50	50	55
	Y-E	400	2.1	57	52	55	53
	Y-C	383	0	59	62	55	54
31	SA-E	420	0.4	52	55	57	48
	Y-E	371	0.7	55	52	64	60
	Y-C	429	0	55	57	52	55
32	SA-E	389	1.2	35	43	35	35
	Y-E	396	2	35	30	34	34
	Y-C	348	0	45	42	45	47
33	SA-E	376	2	39	35	35	32
	Y-E	400	3.5	44	35	30	30
	Y-C	448	0	43	39	38	39
34	SA-E	459	3.9	39	40	54	43
	Y-E	392	6.6	35	20	25	21
	Y-C	401	0	40	34	38	36
35	SA-E	418	5.2	40	22	27	26
	Y-E	392	7.8	43	25	26	30
	Y-C	427	0	41	43	43	43

36	SA-E	422	3.7	40	35	35	33
	Y-E	372	6.4	35	25	26	25
	Y-C	377	0	36	38	35	39
37	SA-E	385	0.2	37	45	35	44
	Y-E	413	0.3	50	46	44	46
	Y-C	400	0	45	38	39	40
38	SA-E	363	2.1	37	35	34	35
	Y-E	415	3.6	48	30	35	37
	Y-C	372	0	45	48	45	48
39	SA-E	407	0.2	36	40	34	36
	Y-E	373	0.2	40	45	37	40
	Y-C	373	0	35	40	34	38
40	SA-E	415	2.6	34	38	38	40
	Y-E	404	5.8	37	31	33	35
	Y-C	382	0	40	49	38	43
41	SA-E	436	0.2	38	42	40	42
	Y-E	345	0.3	44	40	44	41
	Y-C	431	0	40	44	48	42
42	SA-E	387	1.5	43	44	50	41
	Y-E	382	3.4	50	44	42	46
	Y-C	380	0	41	45	44	44
43	SA-E	367	3.2	37	35	30	34
	Y-E	351	4.6	43	35	34	26
	Y-C	488	0	38	34	35	36
44	SA-E	421	4.7	41	36	36	34
	Y-E	364	7.6	46	24	21	24
	Y-C	342	0	44	41	46	50
46	SA-E	376	0.8	41	42	45	48
	Y-E	380	1.5	48	53	51	53
	Y-C	418	0	41	46	40	50
47	SA-E	408	3.3	44	42	30	28
	Y-E	347	4.6	44	28	24	23
	Y-C	441	0	51	51	42	48

Experiment 3
Session 20

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angle	Post-Administration Slip Angle 1	2	3
2	SA-E	414	1.3	54	52	50	55
	Y-E	397	2.1	53	53	44	48
	Y-C	423	0	46	45	57	54
3	SA-E	406	3	44	44	60	55
	Y-E	409	3.7	54	48	54	56
	Y-C	432	0	53	49	55	52
4	SA-E	434	0.2	48	49	53	49
	Y-E	425	0.4	68	63	62	56
	Y-C	443	0	58	54	54	52
6	SA-E	490	1.5	53	55	50	55
	Y-E	493	1.4	56	52	52	50
	Y-C	455	0	62	64	57	60
7	SA-E	478	2.3	49	47	51	54
	Y-E	389	1.2	52	52	51	45
	Y-C	472	0	55	60	59	58
8	SA-E	389	0	52	64	57	63
	Y-E	420	8.1	55	43	49	43
	Y-C	449	0	51	56	57	59
9	SA-E	432	4.3	50	40	40	41
	Y-E	352	5.1	51	44	42	43
	Y-C	513	0	51	56	46	53
10	SA-E	343	4.5	41	38	38	35
	Y-E	407	5.2	54	45	48	40
	Y-C	454	0	51	53	53	54
11	SA-E	406	2.8	47	45	45	49
	Y-E	434	4.2	59	50	58	55
	Y-C	450	0	52	55	53	52
14	SA-E	446	1	54	50	54	56
	Y-E	421	0.9	48	55	55	48
	Y-C	409	0	58	50	55	61
15	SA-E	394	0.4	35	46	50	40
	Y-E	368	0.4	51	45	43	41
	Y-C	375	0	39	38	40	41
16	SA-E	365	6	43	37	34	36
	Y-E	362	7.1	38	38	43	36
	Y-C	415	0	42	43	47	42
17	SA-E	396	0.4	55	59	62	53
	Y-E	431	0.4	49	43	43	45
	Y-C	391	0	63	52	60	52

19	SA-E	350	0.7	35	44	46	45
	Y-E	360	0.8	37	42	45	41
	Y-C	407	0	46	46	54	45
20	SA-E	405	4.7	42	40	40	40
	Y-E	397	5.7	47	38	41	39
	Y-C	378	0	38	38	36	36
21	SA-E	386	0.5	39	54	49	45
	Y-E	354	0.5	48	65	59	56
	Y-C	454	0	40	39	40	46
22	SA-E	383	0.7	43	49	44	42
	Y-E	411	0.9	41	48	38	41
	Y-C	366	0	41	48	41	54
24	SA-E	441	4.9	52	31	31	32
	Y-E	345	7.5	46	26	39	29
	Y-C	446	0	40	50	45	50
25	SA-E	380	1.3	40	37	37	44
	Y-E	439	1.9	45	39	34	44
	Y-C	399	0	47	41	52	47
26	SA-E	396	4.6	45	28	36	43
	Y-E	391	4.7	51	39	50	46
	Y-C	383	0	49	45	51	45
27	SA-E	401	2	51	42	45	42
	Y-E	420	2.6	44	35	36	36
	Y-C	436	0	56	59	56	57
28	SA-E	399	2.1	45	43	50	45
	Y-E	399	2.1	45	40	40	51
	Y-C	382	0	47	52	58	53
31	SA-E	420	0.3	58	58	49	54
	Y-E	374	0.4	58	55	53	49
	Y-C	430	0	54	47	49	54
32	SA-E	401	1.5	32	36	38	35
	Y-E	402	2.7	32	34	31	40
	Y-C	347	0	55	45	34	44
33	SA-E	382	2.5	38	39	30	40
	Y-E	408	4.7	45	33	34	40
	Y-C	454	0	40	40	47	53
34	SA-E	462	4.9	40	36	34	34
	Y-E	384	6.6	35	24	20	23
	Y-C	398	0	38	44	37	40
35	SA-E	418	4.7	45	25	30	35
	Y-E	391	8.4	41	30	31	38
	Y-C	434	0	43	50	47	50

36	SA-E	430	4.7	45	41	46	35
	Y-E	385	5.2	37	33	35	35
	Y-C	388	0	32	37	32	38
37	SA-E	395	0.8	37	43	44	44
	Y-E	420	1.3	51	48	54	49
	Y-C	410	0	40	44	45	48
38	SA-E	369	1.4	40	40	35	44
	Y-E	423	2.4	46	45	35	48
	Y-C	375	0	40	40	38	44
39	SA-E	412	5.1	44	37	37	34
	Y-E	379	6.8	41	30	24	25
	Y-C	378	0	35	38	40	43
40	SA-E	413	2.5	45	36	30	34
	Y-E	404	5.5	45	37	30	34
	Y-C	383	0	40	44	38	43
41	SA-E	436	0.2	37	38	35	42
	Y-E	347	0.3	42	39	38	45
	Y-C	430	0	40	45	47	44
42	SA-E	384	4.5	45	30	29	28
	Y-E	376	8.3	45	24	24	25
	Y-C	379	0	44	40	44	40
43	SA-E	366	2.3	40	36	33	37
	Y-E	351	3	45	30	28	29
	Y-C	490	0	45	45	40	42
44	SA-E	420	2.4	44	37	37	37
	Y-E	352	5.5	44	36	35	45
	Y-C	339	0	40	44	45	50
46	SA-E	375	0.2	43	45	40	50
	Y-E	386	0.4	54	55	55	50
	Y-C	419	0	44	45	40	43
47	SA-E	406	2.7	49	40	35	39
	Y-E	344	3.7	49	35	35	37
	Y-C	438	0	44	48	42	50

Experiment 3
CCR Test

Triad #	Group	Session	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angles	Post-Administration Slip-Angles 1	2	3
2	SA-E	6	413	0	49	56	54	54
	Y-E		406	0	40	44	50	45
	Y-C		427	0	49	47	49	55
4	SA-E	5	415	0	39	47	51	50
	Y-E		420	0	49	57	50	59
	Y-C		438	0	49	63	56	53
7	SA-E	5	464	0	47	53	50	51
	Y-E		391	0	49	50	49	45
	Y-C		440	0	56	51	58	54
9	SA-E	6	423	0	51	52	56	51
	Y-E		347	0	55	52	50	53
	Y-C		484	0	53	52	67	62
11	SA-E	15	394	0	55	59	60	60
	Y-E		429	0	49	53	46	53
	Y-C		438	0	56	62	55	64
14	SA-E	16	443	0	47	60	59	55
	Y-E		422	0	52	56	54	58
	Y-C		406	0	55	60	56	53
15	SA-E	6	384	0	49	56	56	56
	Y-E		365	0	50	54	56	55
	Y-C		370	0	53	49	53	57
16	SA-E	16	354	0	43	57	50	48
	Y-E		361	0	41	48	45	50
	Y-C		400	0	49	46	48	48
19	SA-E	15	343	0	41	56	48	55
	Y-E		357	0	46	47	46	50
	Y-C		403	0	54	58	54	59
22	SA-E	15	370	0	46	43	45	52
	Y-E		396	0	42	43	42	41
	Y-C		357	0	44	48	45	47
36	SA-E	16	411	0	44	60	63	54
	Y-E		385	0	36	47	49	46
	Y-C		372	0	37	48	42	48
40	SA-E	6	428	0	38	45	55	52
	Y-E		400	0	48	49	56	57
	Y-C		376	0	57	57	58	57

42	SA-E	6	381	0	56	56	56	56
	Y-E		406	0	49	52	48	50
	Y-C		383	0	63	53	56	60
43	SA-E	16	357	0	37	52	48	50
	Y-E		340	0	49	53	52	53
	Y-C		478	0	43	37	35	57
44	SA-E	6	412	0	53	58	55	61
	Y-E		393	0	54	58	55	55
	Y-C		335	0	50	47	47	50
46	SA-E	16	373	0	43	54	54	52
	Y-E		369	0	45	50	45	49
	Y-C		400	0	46	49	47	45
47	SA-E	16	404	0	46	55	55	57
	Y-E		351	0	41	60	56	55
	Y-C		436	0	39	50	46	47

Experiment 3
US Only Test

Triad #	Group	Weight	Eth Solution Drank or Infused (g)	Pre-Administration Slip Angles	Post-Administration Slip-Angles 1	2	3
32	SAE-YE	399	3	43	32	31	38
	YE-SAE	400	1.8	40	42	35	38
	Y-C	349	0	48	47	43	49
33	SAE-YE	378	4.6	41	28	27	24
	YE-SAE	398	2.6	40	34	30	30
	Y-C	454	0	41	40	39	43
34	SAE-YE	458	2.1	40	53	38	43
	YE-SAE	384	1.2	38	43	40	38
	Y-C	401	0	38	39	42	47
35	SAE-YE	414	8.4	47	25	30	32
	YE-SAE	391	5.3	52	28	38	34
	Y-C	434	0	44	39	49	48
36	SAE-YE	428	5.5	47	34	29	30
	YE-SAE	383	5.1	34	35	28	32
	Y-C	386	0	33	38	40	36
37	SAE-YE	399	0.9	39	42	45	42
	YE-SAE	419	0.9	48	47	45	44
	Y-C	409	0	39	45	50	48
38	SAE-YE	367	3.1	44	39	36	45
	YE-SAE	421	2	44	50	43	42
	Y-C	370	0	35	40	41	44
39	SAE-YE	408	3.3	42	43	26	23
	YE-SAE	370	1.8	36	53	50	56
	Y-C	377	0	36	47	44	42
40	SAE-YE	414	5.3	41	26	29	28
	YE-SAE	404	2.9	39	39	32	34
	Y-C	384	0	40	46	40	44
41	SAE-YE	434	0.6	36	39	39	44
	YE-SAE	352	0.2	43	41	33	48
	Y-C	431	0	37	40	37	44
42	SAE-YE	385	6	54	34	30	27
	YE-SAE	370	3.4	47	37	39	40
	Y-C	381	0	43	40	42	44
43	SAE-YE	417	6.7	43	25	25	30
	YE-SAE	361	3.2	48	31	34	36
	Y-C	341	0	44	43	46	49
44	SAE-YE	406	1.2	45	31	34	31
	YE-SAE	392	1.1	44	45	42	49
	Y-C	341	0	43	38	38	42

46	SAE-YE	377	1.1	41	42	45	40
	YE-SAE	371	0.5	49	55	53	48
	Y-C	423	0	39	43	40	40
47	SAE-YE	388	4	49	28	32	30
	YE-SAE	346	2.6	49	38	35	30
	Y-C	438	0	40	40	40	40