Intra-Administration Associations and Ethanol Tolerance

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ABSTRACT

Several studies examining the role of environmental cues have demonstrated that Pavlovian conditioning contributes to drug tolerance and withdrawal. More recently, there is subsequent evidence suggesting that internal drug cues also play a role in eliciting conditional compensatory responses. These findings have demonstrated, in intra-drug and intra-administration paradigms, drug-opposite effects in morphine-tolerant subjects when given a very small dose of morphine. This phenomenon has thus far only been demonstrated with morphine. The current experiments seek to examine the role of interoceptive cues in ethanol administration. In an intra-administration design, subjects are trained on intra-gastric ethanol until tolerance develops to alcohol's hypothermic or ataxic effects. It is predicted that alcohol-tolerant subjects will display hyperthermia, or marked increases in temperature, in response to alcohol-onset cues. Similarly, subjects who become tolerant to the motor coordination impairment or ataxic ethanol effects should later display increased coordination and balance during ataxia tilting plane assessments. Although reports in morphine intra-administration designs have demonstrated that early drug-onset cues elicit conditional compensatory responses, such findings were not confirmed with alcohol administration.

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List of Abbreviations

CCR	conditional compensatory response
CR	conditional response
CS	conditional stimulus
DOC	drug-onset cue
E-e 5%	ethanol trained – ethanol probe 5% test
E-e 10%	ethanol trained – ethanol probe 10% test
E-e 20%	ethanol trained – ethanol probe 20% test
E-s	ethanol trained – saline probe test
IG	intra-gastric
IP	intraperitoneal
IV	intravenous
SC	subcutaneous
S-e 5%	saline trained – ethanol probe 5% test
S-e 20%	saline trained – ethanol probe 20% test
S-s	saline trained – saline probe test
UCR	unconditional response
UCS	unconditional stimulus

Chapter 1: Associative Tolerance and the Role of Interoceptive Cues

Pavlovian Conditioning and Tolerance

Tolerance is described as a decrease in effectiveness of a drug over its repeated administration. Previous explanations of the development of tolerance have focused on biological changes in the organism as a result of early drug administrations that attenuate the drug effect (such as changes in population of receptor sites or metabolic adjustments heightening the organism's ability to diminish the drug effect). In addition to physiological factors, Pavlovian conditioning has been implicated as a major component involved in the modulation of tolerance (Siegel, 1975; Siegel et al., 2000). Investigators since the 1960s have proposed that a complete analysis of tolerance requires an appreciation of associative properties because drug tolerance is a form of learning (Cohen et al., 1965). Pavlov (1927, pp.35) suggested that the administration of a drug could be viewed as a conditioning trial in which the drug serves as the unconditional stimulus (UCS). Using the usual conditioning terminology, cues accompanying the primary drug effect function as conditional stimuli (CSs). The direct effect of the drug constitutes the unconditional stimulus (UCS). Prior to any learning, this pharmacological stimulation elicits responses that compensate for drug-induced disturbances. These responses that compensate for the drug effect are "unconditional responses" (UCRs). These UCRs are responsible for acute tolerance or a decrease in drug effect over the course of the administration (see Ramsay & Woods, 1997). After some pairings of the predrug CS and pharmacological UCS, drug-compensatory responses are elicited by the

presence of predrug cues. These conditional compensatory responses (CCRs) counteract the drug effect which mediate the expression of tolerance.

Acute Tolerance

A single administration of a drug may, over the course of the administration session, begin to elicit compensatory responses resulting in a diminished drug effect. This phenomenon is termed acute tolerance and is demonstrated the very first time the drug is administered (Ramsay & Woods, 1997; Siegel & Allan, 1998). Upon administration, a subject will encounter an unmodified drug effect. For instance, organisms receiving ethanol will demonstrate hypothermia or a marked decrease in body temperature. However, over the course of the drug administration, particularly infusions delivering the drug at a steady rate, the effects of the drug become attenuated. In the case of ethanol administration, gradual increases in temperature are evident over time within a single drug session (Ramsay & Woods, 1997). In an experiment assessing acute tolerance, subjects implanted with pellets triggering continuous slow morphine release into the body initially demonstrated analgesic effects; however, continued slow morphine release yielded a diminished analgesic response over time. More striking is the finding that the abrupt termination of opiate administration via pellet removal elicited hyperalgesia or a heightened sensitivity to pain. (Wei & Way, 1975; Ramsay & Woods, 1997). Drug-opposite responses of this nature, following sudden termination of a single administration have been demonstrated with numerous other drugs including epinephrine (Bevan, 1983), atropine sulfate (Finch, 1938), insulin (Woods, 1995), and ethanol (Mellanby, 1919). The existence of acute tolerance demonstrates that pharmacological effects initiate

physiological responses that compensate for the primary drug effect (Ramsay & Woods, 1997).

Chronic Tolerance

Repeated drug administration over trials will lead to elicitation of compensatory mechanisms, not only unconditionally-- in response to the drug (as in acute tolerance) but also conditionally in response to cues present at the time of drug administration. The drug-paired cues serve as CSs signaling that the drug effect is imminent, and these cues come to elicit CCRs. Therefore, over trials, drug-tolerant organisms will display conditional compensatory responses (CCRs) to stimuli that have been systematically paired with the drug. For example, in the case of ethanol, the cues associated with drinking (such as a particular bar) serve as CSs which will elicit a CCR of hyperthermia in anticipation of alcohol-induced hypothermia. The attenuation of the drug effect over repeated administrations as a result of these CCRs is termed chronic tolerance and following the usual terminology, will hereafter be referred to as tolerance (Siegel, 2000; Kim et al., 1999).

Predrug Cues

Cues surrounding the drug administration ritual such as the environment, drug paraphernalia, and drug preparatory rituals are referred to as predrug cues. The expression of CCRs is apparent in the presence of predrug cues when the drug is absent. The drug compensatory response is revealed by cues in the absence of subsequent drug administration (Siegel, 1987). One of the earliest reported studies examining the effects of CCRs in the absence of the drug was conducted by Subkov and Zilov in 1937. In this

experiment, dogs receiving injections of adrenalin showed diminished responses to the drug's tachycardiac effects over trials, i.e. the adrenalin-elicited heart rate on trial 6 was dramatically lower than it was on trial 1. To assess compensatory responses that mediate the diminished effect of the drug, the dogs were given an inert substance, Ringer solution, rather than adrenalin. The mere presence of drug-predictive cues in the absence of adrenalin caused subjects to display a dramatic decrease in heart rate. Other parasympathetic responses opposite in nature to the effects of adrenalin were noted as well (Subkov & Zilov, 1937). Thus, the diminished effect of the drug over trials, i.e. tolerance, is a manifestation of the systemic drug effect coupled with CCRs acting to attenuate the drug effect. Because the presence of drug-associated stimuli are known to trigger drug-opposite responses, it is of no surprise that withdrawal symptoms are typically opposite in nature to the systemic drug effect. This phenomenon may account for evidence suggesting that individuals confronted with drug-associated stimuli, i.e. a bar where alcohol is typically consumed or the site of a hypodermic needle previously used in drug administration, display withdrawal responses and drug craving (Koob et al., 1989).

Situational Specificity of Tolerance

Experimental designs in which drugs are explicitly paired with a distinctive context have generated findings suggesting that the context is associated with the drug. If the tolerant organism receives the drug in an environment that has been previously paired with its administration, tolerance will be fully expressed. Conversely, receiving an equivalent dose of the drug in a context not previously associated with the drug leads to a

considerable loss of tolerance (Siegel et al., 2000). This demonstration of tolerance dependent on environmental cues previously associated with the drug is known as "situational specificity of tolerance" (Siegel, 1976). The phenomenon is evidenced when tolerance is more pronounced in the presence of usual drug administration cues rather than alternate cues (Siegel, 2001B). Situational specificity of tolerance has been demonstrated across species and with drugs such as alcohol (Poulos & Cappell, 1979; Melchior, 1990; Dafters & Anderson, 1982), benzodiazepines (King et al., 1987), opiates (Hinson & Siegel, 1986; Mucha, Volkovsiks, & Kalant 1981), amphetamine (MacRae et al., 1987; Obal, 1966), caffeine (Andrews et al., 1998; Rozin et al, 1984; Corti et al., 2002), and nicotine (Cepeda-Benito et al., 1998; Cepeda-Benito et al., 2000).

Situational Specificity to the Lethal Effects of a Drug

Dramatic instances of situational specificity of tolerance involve overdose incidences in both animals and humans in which the usual drug context is altered. In 1972, Brecher observed that many individuals suffering from opiate death were not, in fact, maintaining a high enough level of opiate toxicity conducive to clinical overdose, particularly in experienced drug users. It has since been speculated that key factors at play in eliciting these unusual instances of overdose were occurring as a result of drug use under novel conditions. In administering the drug in an environment not previously associated with drug administration, CCRs responsible for attenuating the effects of the drugs are not effectively elicited heightening the possibility of drug overdose. Studies indicate that failure of tolerance demonstration in cases of human overdose in opiate addicts were more likely to be reported in a novel situation or environments other than

ones which addicts routinely administered drugs. Self-report studies have concluded that addicts suffering from and surviving overdoses have admitted to having administered opiates, of a dose normally tolerated with no complications, under unusual or novel circumstances at the time of drug overdose (Gutierrez-Cebollada et al., 1994; Siegel, 2001B).

Findings which further indicate the role of environment and its profound effect on survival with sublethal drug doses are reported in numerous animal models. Animal studies examining the mortality rate of subjects given a sublethal dose of heroin in an environment previously paired with the drug show statistically lower mortality rates than those subjects with identical drug histories receiving the drug in the unpaired environment. Heroin-tolerant rats given a lethal dose of the drug in an environment paired with saline were almost twice as likely to suffer from overdose than subjects receiving the same potentially fatal drug dose in a context in which heroin was typically administered (Siegel et al., 1982). Similar animal designs have demonstrated the importance of environmental cues in modulating tolerance to the lethal effects of ethanol (Melchior et al., 1982; Tsibulsky & Amit, 1993) and barbiturates (Vila, 1989).

Role of Pharmacological Cues

In addition to the role that exteroceptive cues play in eliciting CCRs, there is evidence that subjects rely on internal stimuli which also mediate the expression of associative tolerance. Recent reports indicate that CCRs are elicited not only by external cues associated with the drug effect but also by interoceptive cues. For instance, drug effects may serve as CSs. There is evidence to suggest that a stimulus typically serving

as a UCS may also signal the arrival of another UCS (Goddard, 1999). Thus, it is not surprising that cues related to the internal drug effect of one drug may serve as a cue for another drug when the two are typically combined in the drug-administration ritual. Organisms may come to associate the interoceptive effects of two drugs when one is typically preceded by the other (Taukulis, 1986). Internal cues associated with drug A may signal the administration of drug B. Thus, drug A becomes a CS for further drug administration and will begin to elicit drug-opposite responses of drug B. The examination of these learned associations between drug states has been termed "inter-drug conditioning" (Kim et al., 1999; Siegel, 2001A). For example, Taukulis (1985) used an inter-drug paradigm in which atropine sulfate was administered prior to various hypothermia-inducing agents (either ethanol or chlorpromazine) over repeated training sessions. Findings indicated that upon repeated administration of these paired injections, the mere presentation of atropine sulfate alone, which typically has no significant impact on temperature, came to elicit conditional hyperthermia (Taukulis, 1985).

In a similar design, Taukulis (1986) also demonstrated a conditional hyperthermic response to atropine when it had previously served as a signal for pentobarbital, another drug inducing hypothermia under normal circumstances. A similar inter-drug finding indicated that when pairing a cue drug (pentobarbital) with an immunosuppressant drug (cyclophosphamide), pentobarbital elicited a CCR of enhanced immune functioning (MacQueen & Siegel, 1989). It has been established through other investigative exemplars that combinative drug administration conditionally affect behavioral outcomes and tolerance expression (Lett, 1983; Revusky et al., 1979; Taukulis, 1985).

Furthermore, it is has been demonstrated that a single drug may actually serve as a cue for itself. One small dose of a drug may come to signal a subsequent dose of the same drug (Goddard, 1999). This phenomenon is known as intra-drug conditioning (Siegel, 2001A). The earliest demonstration of intra-drug conditioning was reported by Greeley et al. (1984). In this experiment, rats in a paired group were repeatedly injected with a 0.8 g/kg dose of ethanol 60 min prior to a 2.5 g/kg dose of ethanol. Rats in an unpaired group received injections of the two doses in a noncontingent manner. Paired rats, but not unpaired rats, displayed tolerance to the larger dose of the drug if it was first preceded by the smaller dose. These paired rats when administered the 2.5 g/kg dose without the usual small dose cue failed to demonstrate tolerance to the hypothermic effect of ethanol evidenced by ethanol-induced hypothermia. Tolerance to ethanol's hypothermic effect was evident if, and only if, the large dose was preceded by the small dose. Moreover, subjects in the paired group displayed a CCR of hyperthermia in response to the small ethanol dose alone (Greeley et al., 1984).

Greeley et al.'s (1984) intra-drug conditioning findings have also been demonstrated with morphine. Although an intra-drug association failed to elicit CCRs in an initial design by Tiffany & Cepeda-Benito (1993), the results of more current research indicated such an effect (Cepeda-Benito & Short, 1997; Sokolowska et al, 2002.). In the more recent experiment examining the role of Pavlovian conditioning and interoceptive drug cues, a 4 mg/kg dose of morphine served as the conditional cue for a later dose of 12 mg/kg. Rats in the explicitly paired group in which the small dose preceded the larger one displayed stronger tolerance, as indicated in tail flick latency measures, than rats in an

unpaired group receiving 16 mg/kg in a single administration (Cepeda-Benito & Short, 1997).

Drug-Onset Cues and Intra-Administration Associations

There is the potential for an association between a small and large drug effect whenever a drug is administered, even if there is no explicit parings of the two drug doses. Within a single administration, early drug onset cues (DOCs) inevitably signal a later, larger drug effect. Ultimately, because the early effect of the drug can come to conditionally signal the later drug effect, it also thought that such mediation of tolerance is expressed within a single drug administration (Siegel et al., 2000). Whenever a drug is administered, particularly with a route of administration in which the drug effect occurs gradually, the early drug effect becomes associated with the later, fuller effect (Grisel et al., 1994, Kim et al., 1999; Sokolowska et al., 2002). An association formed between the early drug effect, or the DOCs, and the larger, subsequent effect formed within a single drug administration has been termed an "intra-administration association" (Kim et al., 1999). According to a conditioning analysis of tolerance, it is predicted that in a single drug administration, the early DOCs will come to serve as CSs which signal the arrival of the full drug effect. Thus, the initial drug effect associated with the full drug effect will elicit CCRs attenuating the full drug response and helping to establish tolerance. Similarly, withdrawal symptoms manifested as drug-opposite responses are evident from tolerant organisms which are exposed to very small doses of the drug (Krank, 1987; McDonald & Siegel, in press).

One of the earliest examinations of an intra-administration association was reported by Kim et al. (1999) in which subjects were made tolerant to the analgesic effects of 5 mg/kg IV morphine administered over a thirty min infusion. Following tolerance training, subjects presented with the initial ten percent dose of the original morphine infusion displayed hyperalgesia, paradoxically, in response to the initial morphine DOCs when compared with control groups. Such findings are somewhat counterintuitive in that a small dose of morphine given to a tolerant subject may come to produce hyperalgesia, a response opposite to that of opiates. Subsequent parametric work has confirmed that a ten percent morphine dose of the original 10 mg/kg is the optimal probe dose in effectively eliciting CCRs with morphine (Sokolowska et al., 2002).

Overshadowing of Cues

Because exteroceptive cues have consistently been implicated in a Pavlovian conditioning analysis as mediating the expression of tolerance, there are conflicting data as to when the organism relies on the presence of internal or contextual cues (Tiffany & Cepeda-Benito, 1993; Sherman, 1979; Grisel et al., 1994). It is reasonable to assume that an organism will use both internal and external cues dependent on which are available. It is speculated that DOCs, when present, may overshadow environmental cues. Because interoceptive cues occur in a perfectly positive contingent manner with the full drug effect and are novel, these cues are held to be more salient in nature than environmental cues (Kim et al, 1999; Mackintosh, 1987). Thus, it is of no surprise that in gradual-onset routes of morphine administration such as intraperitoneal (IP) and subcutaneous (SC), contextual tolerance is less pronounced than in faster-onset routes such as IV (Grisel et

al., 1994). This is because the drug effect occurs slowly in IP and SC forms of administration allowing the subject access to DOCs predictive of the peak effects. Conversely, DOCs are not present in IV infusions given over a few seconds, as the drug effect tends to take effect very rapidly which may cause subjects to rely more heavily on environmental, drug-paired cues.

A discrimination design conducted by Kim et al. (1999) has examined the role of interoceptive and exteroceptive cue salience by manipulating drug route of administration and cues signaling the delivery of morphine. Findings of the study indicated that subjects trained on slow infusions of IV morphine elicited CCRs in response to small DOCs. The CCRs of hyperalgesia were demonstrated despite external cues simultaneously present during testing which indicated a saline infusion was to be administered. In this experiment, the internal cues of the early morphine effect overshadowed external stimuli which indicated the absence of morphine. Conversely, subjects receiving very short duration IV infusion relied more on environmental cues and responded to these contextual cues predictive of morphine delivery even when saline was administered. Thus subjects with access to DOCs in slower routes of administration relied on internal drug cues in emitting CCRs, whereas a fast route of administration required the subject to rely more on environment cues (Kim et al., 1999). Thus in examining the role of intra-administration associations, it is important to implement controls assessing both environmental and interoceptive associations to ascertain which response is mediating CCRs. This is because environmental cues are present in both types of examinations. The present experiments assess the role of environmental cues by incorporating a drug-trained

group tested with saline probes to assess the role of environmental cues in addition to examining the role of alcohol DOCs of subjects tested with small drug probes.

Drug-Onset Cues and Alcohol – Present Designs

Although intra-administration association effects have been recently demonstrated with morphine, intra-administration associations have not been demonstrated with any other drug. Therefore, in the present experiments, the role of DOCs is examined further by assessing their role in alcohol tolerance. To make the data as generalizable as possible to humans, all subjects were given alcohol infusions intra-gastrically as this drug in humans is typically consumed orally and absorbed in the stomach and small intestines (Brands et al., 1998). Telemetric devices were surgically implanted to assess ethanol's thermic effect in a noninvasive manner to avoid problems of stress-induced temperature increases (Thornhill et al., 1978). In the present experiments, rats received long-duration infusions of ethanol until tolerance to the drug's hypothermic effect was observed. Similar to experiments which have given morphine-tolerant rats small probes of the drug, subjects in the current design are given various small doses of alcohol following tolerance acquisition to assess CCRs of increases in body temperature in response to DOCs (Kim et al., 1999).

Other experiments examined CCRs elicited by alcohol-onset cues by measuring subjects' ataxia or motor impairment. It is predicted that in response to alcohol-onset cues, rats tolerant to the motor coordination impairment of the drug will display "hypertaxia" (see Larson & Siegel, 1998) in response to a small alcohol dose. Because there is evidence to suggest that environmental cues also play a role in mediating the

expression of tolerance, control subjects receiving alcohol training are tested with an inert substance to assess CCRs in response to mere contextual cues despite the long-duration infusion rate. It is predicted in the current designs that rats paired with long-infusion alcohol administration will display CCRs to very small doses of alcohol. Because the role of DOCs have never before been evaluated in alcohol administration, several small probe parameters are presented in various groups and experiments to determine what percent of the original dose is most effective in eliciting CCRs.

Chapter 2: Examination of Conditional Hyperthermia in Response to Alcohol-Onset Cues

Despite promising findings with morphine which indicate DOCs elicit CCRs, this intra-administration effect has never been demonstrated with any other drug. Therefore, the current experiments were conducted to examine drug-onset cues in alcohol administration, a substance used regularly in humans. The effects of alcohol, in the present designs, are assessed by looking at temperature. Perturbations in temperature following ethanol administration are easily observable as the drug produces profound hypothermia (decrease in body temperature). Twenty min infusions are utilized to allow a sufficient amount of time for DOCs to be detected in subjects. In an effort to elucidate the role of alcohol DOCs, subjects are trained on intragastric (IG) ethanol until tolerance develops, and then tested with very small probes of the drug. It is predicted, in the following experiments, that rats should demonstrate a CCR of hyperthermia in response to a small dose of the drug serving as an alcohol-onset cue.

Experiment 1A

Method

Subjects. The subjects were 12, experimentally naïve, Long Evans rats (received from Charles River, Quebec) with weights ranging from 300 to 325 g at the time of surgery. The animals were individually housed and given ad lib access to food and water. Subjects were kept on a 12 hour light:dark cycle (lights on 0700). All animals were handled for one week prior to surgery .

Surgical preparation. All subjects were fully anesthetized under a ketamine and xylazine cocktail, and were implanted with intra-gastric catheters from a procedure modified from Cox (1990). The catheters were made from silastic tubing (0.76 mm x 1.65 mm) and were approximately 20 cm in length. The catheter consisted of a 20 gauge needle going directly into the tubing on one side and two balls made of silastic glue, approximately one cm apart, on the other. The outermost ball was inserted directly into the stomach, while the other served as an anchor on the outside. Purse-string sutures in the stomach kept the catheter firmly in position. The tubing was then run under the shoulder to the back of the neck. The end of the needle, anchored under the skin with dental cement and mesh, was secured at the back of the neck and protruded through the skin. The opening of the needle was, then, sealed with a plastic lid. Telemetric emitters (Mini-Mitter Company Inc.) were surgically implanted in the lower peritoneal cavity. Immediately following the surgeries, subjects were permitted to recover for one week. Their catheters were flushed with sterile water, daily, during the recovery period.

Drugs

A 66% ethanol solution was prepared, by volume, from 100% ethanol and 0.9% sodium chloride solution.

Apparatus

Infusion chambers. Infusions were given in one of five identical chambers (30.4 cm X 20.5 cm X 19cm, Lehigh Valley Electronics). The chambers were constructed of clear Plexiglas with a grid floor, and were housed inside larger, sound-attenuating chambers. A syringe pump (Sage Model 341A) was located at the top of the chamber

next to a small opening that allowed the tubing to run from the syringe pump into the animal chamber. A 10-cc syringe, attached to Masterflex Tygon tubing, was connected to the syringe pump. A threaded, plastic connector was attached at the end of the tubing in the animal chamber to attach the subject's catheter to the tubing. The syringe pump delivered infusions at a rate of 0.20 ml per min.

Temperature platforms. After the infusions, animals were transported to a separate room across the hallway which housed ten, temperature-reading platforms. During temperature measurements, a subject was placed on the platform in the animal's home cage. The platforms collected information from the surgically implanted emitter, and a temperature reading was generated to a computer output system every min (Vital View, Mini-Mitter Company Inc., Oregon).

Procedure

Baseline. Immediately following recovery from IG surgery, all subjects were taken from their home cages, weighed, and placed in the infusions chambers. The animals were given saline infusions at a dose volumetrically equivalent to 6 g/kg, over a 20 min infusion duration, depending on the subject's weight. Immediately following the saline infusions, all animals were placed back into their home cages and transported to the temperature chamber. Subjects were placed on their assigned platforms and temperature read-outs were generated every min for a 90 min session. This procedure was repeated daily for four days. On baseline day 4, the subjects were split into three groups based on temperature history. The groups were split in such a way that there were no significant differences in temperatures (see Results). Three subjects were placed in the Saline-saline

group (S-s). Six subjects were assigned to a Saline-ethanol group (S-e). The remaining three subjects were assigned to group Ethanol-ethanol (E-e). Group abbreviations indicate the substance that the rat received during all training days; i.e. E means ethanol trained and S refers to saline trained animals. The subsequent lower case abbreviation refers to the substance the animal received during the test phase immediately following training.

Training Phase. During the training phase, the E-e group received, daily, 20 min infusions of ethanol at a dose of 6 g/kg. The S-s and S-e groups received volumetrically equivalent infusions of saline over the same infusion duration. Upon the completion of the infusions, all subjects were transported to the temperature room. Temperatures were recorded every min for a 90 min period. This procedure was conducted every day for ten consecutive days.

Test Phase I. On test day, all subjects received a small 2 g/kg probe (approximately 33% of the original dose) over a 4 min infusion period. Groups E-e and S-e received a 2 g/kg ethanol probe. Groups S-s received a volumetrically equivalent probe of saline over the 4 min infusion. Immediately following the probes, all subjects were transported to the temperature chamber, where their temperatures were recorded for 90 min.

Retraining. Because a 2 g/kg ethanol probe in the E-e group did not produce significant hyperthermia (see Results), subjects were retrained for four consecutive days, in the manner previously described in the training phase, to ensure that tolerance development was fully expressed.

Test Phase II.

On the second test day, all subjects again received a small probe. This time a 1 g/kg probe was administered. The S-e and E-e groups (retrained on saline and ethanol respectively) received a 1 g/kg ethanol probe (approximately 16% of the original dose) over a 4 min infusion. The S-s group (retrained with four days of saline) received a saline probe volumetrically equivalent to 1 g/kg. All subjects' temperatures were measured for a 90 min period.

Results and Discussion

A two-way mixed factor analysis of variance (ANOVA), for within factors with repeated measures (five min blocks of the 90 min period) and between factors (groups) conducted on baseline day four indicated no significant differences among the three groups, $p > 0.05$. This suggests that the groups were split in such a way that temperatures did not differ prior to the training phase of the experiment. The same analyses run on training day 1 indicated a group difference, $F(2, 17) = 9.89$, $p < 0.001$. A Tukey HSD post-hoc analysis indicated differences among the S-s and E-e groups, $p < 0.01$and between groups S-e and E-e, $p < 0.05$. This demonstrates the hypothermic effects of the 6 g/kg ethanol dose on the first day of administration. The decrease in temperature over the 90 min temperature reading of the E-e group compared to groups S-s and S-e is illustrated in Figure 1. A two-way ANOVA conducted on the final day of the training phase indicated no differences among the three groups, $p > 0.05$. This analysis confirms tolerance development of subjects in group E-e at the completion of the training phase (see Fig 2).

Upon having received a 2 g/kg ethanol probe during test phase I, it was predicted that the E-e group should demonstrate a CCR of hyperthermia. Also, because during test phase I, S-e subjects received their first ethanol infusion of 2 g/kg, it was predicted that this group should demonstrate a drop in temperature compared to other groups due to ethanol's initial, hypothermic effect. The analyses for test phase I, shown in Figure 3, indicate no group differences, $p > 0.05$. Group E-e did not demonstrate increases in temperature upon receiving a 2 g/kg ethanol probe as was predicted. After four days of retraining, subjects were retested. This time groups E-e and S-e were given a smaller ethanol probe of 1 g/kg. The results of test phase II are presented in Figure 4. Despite overall higher mean temperatures of group E-e compared to the other groups from 60 to 90 min, overall group differences did not reach statistical significance. Similar to findings seen in test phase I, E-e subjects did not display dramatic increases in temperature in comparison to groups S-e and S-s as a result of ethanol CCRs. A two-way ANOVA confirm no temperature differences among the three groups, $p > 0.05$. Because there is a slight increase in temperature of group E-e over time, it is possible that the probe doses of 1 g/kg and 2 g/kg ethanol are large enough doses of the drug to mask CCRs by attenuating compensatory effects. Therefore, smaller probes are utilized in subsequent experiments.

Experiment 1B

The results of Experiment 1A provided no evidence for a CCR of hyperthermia in response to 16% and 33% probes in group E-e. Because the drug effect during the test phase may mask hyperthermic CCR effects with 1 g/kg and 2 g/kg test doses, smaller

ethanol probes may be needed to isolate alcohol CCRs. Therefore, in the following experiment, ethanol probes on test day were decreased to between 0.60 g/kg and 1.2 g/kg. These probes are systematically related to the training dose, i.e. 10% of the original ethanol dose at 10% the infusion time and 20% of the original ethanol dose at 20% the infusion duration. Also, in the present experiment, the training phase was extended to twelve days in an attempt to assure that tolerance to the hypothermic effects of alcohol was displayed in all subjects.

Method

Subjects. The subjects were 22, experimentally naïve, Long Evans rats (received from Charles River, Quebec) with weights, handling, and housing environments the same as previously described in Experiment 1A.

Surgical Preparation. All experimental subjects were surgically implanted with intra-gastric catheters and electronic emitters in the same surgical procedure as previously described in Experiment 1A.

Drugs

A 66% ethanol solution was prepared, by volume, from 100% pure ethanol and 0.9% sodium chloride solution.

Apparatus

The two experimental environments described in Experiment 1A were used in the following study.

Procedure

Baseline. The saline, baseline days were administered in the same manner as described in Experiment 1A. After baseline day four, the subjects were split into two groups for the training phase. Fifteen of the subjects were designated to an ethanol group to be trained on 6 g/kg ethanol. The remaining seven rats were assigned to a saline control (S-s). Mean temperatures for both groups were approximately equal.

Training Phase. During the training phase, all subjects were weighed and placed in the infusion chambers. The ethanol group received a 6 g/kg ethanol infusion over a period of approximately 20 min (the exact infusion duration depending on the animal's weight). The saline group received a volumetrically equivalent saline dose for the 20 min infusion. Immediately following the infusions, all subjects were transported in their home cages to the temperature room. There, the animals' temperatures were recorded every min for a 90 min session. After training day 12, the fifteen ethanol subjects were divided into three similar groups, based on their temperature histories during the training phase. They were assigned to groups based on the test probes to be administered following the training phase as follows: group E-e10% (n=5), E-e20% (n=5), and E-s (n=5).

Test Phase. Immediately following the training phase, all subjects were given saline or ethanol probes on test day. The saline control group (S-s) and one group previously trained on ethanol (E-s) were given saline probes that were 20% of the original training dose (1.2 g/kg) over an infusion duration that was 20% of the duration administered during training (approximately 4 min). Similarly, group E-e20% received a 20% ethanol probe of the original dose at 20% of the time (1.2 g/kg in 4 min). The E-

e10% group received a 10% ethanol probe (0.60 g/kg) during a 2 min infusion. Infusion rates and ethanol concentration remained the same as during the training phase. Only the dose and infusion times were manipulated. Immediately following the infusions, all subjects were transported to the temperature platforms where their temperatures were measured for a 90 min period.

Results and Discussion

Figure 5 illustrates temperature data for day 1 of the training phase. As can be seen, there is a substantial hypothermic effect due to drug exposure in the ethanol group compared with the saline control group. This dramatic drop in body temperature yielded statistically significant group differences as indicated in a two-way ANOVA with repeated measures, $F(1, 17) = 16.31$, $p < 0.0001$. An analysis examining temperature differences of groups S-s, E-s, E-e10%, and E-e20% on training day 12 indicated significant group differences after group assignment as well, $F(3, 17) = 9.53$, $p < 0.01$ (see Fig. 6). Post-hoc Tukey HSD tests indicated that group E-e20% differed from group S-s and E-s, $p < 0.05$ (see Fig. 6). As can be seen in Figure 6, there is large degree of variation between all groups. In addition, the ethanol-trained subjects do not appear to have expressed full tolerance development. Unfortunately, these temperature inequalities, which were the result of forced placement due to an extreme degree of variability of temperature between subjects, may have adversely affected the results during testing. Figure 7 illustrates the temperature means for each group upon receiving the test probes. There were no group differences in the test phase as indicated by a two-way ANOVA, $F(3, 17) = 1.13$, $p > 0.05$. These findings indicate that CCRs represented by hyperthermic

responses in groups E-e10% and E-e20% are not displayed. Similarly, there appear to be no evidence of CCRs resulting from environmental cues alone, as group E-s was not hyperthermic in comparison to the S-s control. Test data indicate minimal differences among all groups. Due to a large degree of variability in subject temperatures across the training phase, extreme caution is taken when splitting experimental groups in the latter days of training. The ethanol training dose, the key factor in variability of temperature effect and compromised health of a few subjects, is lowered in subsequent experiments as a result.

Experiment 1C

The IG ethanol dose of 6 g/kg used in Experiment 1B had health effects on experimental subjects lending to a high degree of variability in temperature scores during the training and test phases. Several subjects experienced serious, deleterious effects from the 6 g/kg ethanol dose such that weight loss and adverse health effects were noted. As a result, subjects were trained on a 4 g/kg dose in the present experiment. All other experimental groups and infusion parameters remained constant.

Method

Subjects. The subjects were 18, experimentally naïve, Long Evans rats (received from Charles River, Quebec) with weights, handling, and housing environment the same as those in Experiment 1A.

Surgical Preparation. The surgical procedure in this design is the same as previously described in Experiment 1A.

Drugs

A 45% ethanol solution was prepared, by volume, from 100% absolute ethanol and a 0.9% sodium chloride solution.

Apparatus

Testing and infusion chambers were the same as described in Experiment 1A.

Procedure

Baseline. All subjects were infused with physiological saline at a dose volumetrically equivalent to 4 g/kg over a 20 min infusion. Temperature measurements were recorded for 90 min following the infusions. This procedure was repeated for four days. After the final day of baseline, subjects were split into two similar groups based on temperature reports. Four subjects were assigned to a saline group (S-s), and the remaining fourteen subjects were assigned to an ethanol group.

Training Phase. The twelve days of ethanol training were identical to the procedure described in Experiment 1B. The only difference in the training procedure, in the present experiment, was a smaller ethanol dose. All ethanol subjects were trained on 4 g/kg ethanol of a 45% solution. S-s subjects were trained on an equivalent saline infusion for 20 min After the completion of training, the fourteen ethanol subjects were split into the three test groups: E-s (n=4), E-e10% (n=5), and E-e20% (n=5). The remaining subjects (n=4) were assigned to group S-s.

Test Phase. On test day, all subjects were given a probe infusion of either saline or ethanol. Subjects in groups S-s and E-s received a saline infusion that was 20% of the original 4 g/kg infusion dose given during training (0.80 g/kg) at 20% of the infusion

time (approximately 4 min). The E-e20% group received 0.80 g/kg ethanol over approximately 4 min. The E-e10% subjects were given ethanol infusions that were 10% of the training dose at 10% of the time (approximately 0.40 g/kg ethanol in 2 min). Immediately following the infusions, all subjects were transported to the temperature chamber where temperatures were recorded for 90 min.

Results and Discussion

A decrease in body temperature of the ethanol-trained group upon receiving a 4 g/kg dose when compared with the saline group is illustrated on the first day of the training phase (see Fig 8). A two-way mixed factor ANOVA confirmed ethanol and saline group differences on training day 1, $F(1, 17) = 8.56$, $p < 0.01$. As expected, due to the development of ethanol tolerance, no group differences were demonstrated on training day 12. An analysis of the three ethanol-trained groups and S-s signifies no group differences based on temperature when subjects were assigned to test groups on training day 12, $F(3, 17) = 1.00$, $p > 0.05$ as is displayed in Figure 9. Counter to predictions suggesting CCRs would be elicited by ethanol-onset cues, a two-way mixed factor ANOVA for the test phase indicate no group differences between temperatures, $F(3, 17) = 0.90$, $p > 0.05$. This suggests that the E-e10% and E-e20% did not reliably demonstrate hyperthermic effects in response to the ethanol probes (see Fig. 10). In addition, there is no evidence that environmental cues are eliciting conditional hyperthermia in the E-s group. This group's temperature mean is not statistically different from subjects in group S-s, E-e10%, or E-e20%. As can be seen in Figure 10, there is considerable overlap among all group temperature means on test day. A final experiment

to follow aimed at elucidating the role of ethanol-onset cues in eliciting temperature CCRs utilized longer infusion durations and an extensive number of control and interoceptive probe groups. In addition, a smaller dose of ethanol of 3 g/kg is used in the subsequent experiment because higher doses had deleterious effects on a small number of ethanol subjects. A few of the rats receiving 4 g/kg to 6 g/kg ethanol infusion in the previous experiments showed pronounced drug induced catatonia and lost weight over training days.

Experiment 1D

In the present experiment, the infusion duration was extended to approximately 40 min to 50 min, depending on the animals' weights; an infusion duration twice as long as previously administered. A more moderate dose of 3 g/kg was used. Because alcohol intra-administration associations have never before been investigated, the effective probe parameters used to assess CCRs of the alcohol-onset cues have not yet been established (see Experiments 1A-1C). Therefore, a 5% ethanol probe group was included in the current experiment. An examination of group differences was examined based on test-phase findings. It was predicted that ethanol-trained subjects receiving ethanol (groups E-e5%, E-e10%, and E-e20%) would display hyperthermia in response to alcohol-onset cues. Difference scores of temperatures on the final day of baseline and temperature scores on test day were examined for each individual subject, and overall difference score means were calculated for each group. Differences in temperature change of each group overtime (from saline during baseline 4 to the test phase) were then analyzed between all experimental groups.

Method

Subjects. The subjects were 73, experimentally naïve, Long Evans rats (received from Charles River, Quebec) with similar housing arrangements and weights as previously described in Experiment 1A.

Surgical Preparation. All subjects were surgically implanted with electronic emitters and intra-gastric catheters in the same procedure as described in Experiment 1A.

Drugs

A 33% ethanol solution was prepared, by volume, from 100% absolute ethanol solution and 0.9% sodium chloride.

Apparatus.

Infusion and temperature-measuring apparatuses are the same as previously described in Experiment 1A. Due to an extended infusion period, the infusion pumps were connected to a 5-cc syringe, and solutions were administered at a rate of 0.07 to 0.10 ml per min, depending on the subjects' weights.

Procedure

Baseline. All subjects were removed from their cages, weighed, and placed into the infusion chambers. Once connected to the tubing, the animals received saline infusions volumetrically equivalent to 3 g/kg over, approximately, a 40 min infusion period. After the infusions, all rats were transported to the temperature chamber, where their temperatures were recorded every minute for a 90 min session. This procedure was carried out for four days. On baseline day four, thirty-one rats were designated to a saline group and the equated forty-one were assigned to the ethanol group.

Training Phase. During tolerance development, saline subjects were given daily infusions of saline in a manner identical to that of baseline over twelve days. Ethanol subjects were given 3 g/kg over an approximately 45 min infusion. Following the infusions, all subjects' temperatures were recorded for 90 min. After training day 12, the forty-two ethanol subjects were split into four, separate, probe groups based on temperature histories. Alcohol trained subjects were assigned to the following groups: E-e5% (n=11), E-e10% (n =11), E-e20% (n=11), and E-s (n=9). Similarly, based on temperature histories, the saline control subjects were split into three groups and assigned to either the S-s (n=13), S-e5% (n=9), or S-e20% (n=9) group.

Test Phase. Immediately following the training phase, all subjects were tested with a small probe infusion. S-s subjects received a saline probe consisting of 20% of the original saline infusion (0.60 g/kg) at 20% of the infusion time (approximately 8 min). Similarly, the E-s group previously trained on ethanol received a 20% saline probe over an 8 min infusion period to assess the role of environmental cues in ethanol CCRs. The E-e20% group also received a 0.60 g/kg ethanol probe over approximately 8 min. The E-e10% group received a 0.30 g/kg ethanol probe over approximately 4 min. The E-e5% group received 0.15 g/kg ethanol probe over approximately a 2 min long infusion. The two remaining saline-trained control groups each received a small ethanol infusion. Group S-e5% received a dose of ethanol roughly 5% of the saline training dose at 5% of the infusion duration (0.15 g/kg in 2 min). And the S-e20% group received a 0.60 g/kg ethanol dose over approximately 8 min. Immediately following the probe infusions, all

subjects were transported in their home cages to the temperature room. Their temperatures were recorded every min for a 90 min period.

Difference Scores

In addition to between-group analyses conducted during the test phase as is done in the previous experiments, temperature changes within groups at the completion of the training phase from the beginning were assessed. Difference scores of temperatures for all subjects in each group during baseline day 4 were subtracted from temperatures on the test day. Thus, changes from the original saline injections to small ethanol/saline injections were calculated to see within differences upon receiving the treatment. A mean was then calculated for each group's temperature differences from baseline 4 to the test phase.

Results and Discussion.

A two-way mixed factor ANOVA, for within factors with repeated measures conducted on training day 1, indicated group, temperature differences, $F(1,17) = 34.61$, $p < 0.001$. As is illustrated in Figure 11, a dose of 3 g/kg elicited a hypothermic response in ethanol subjects compared to saline subjects. The same analysis indicated that there were no group differences on training day 12 of the training phase, $F(6, 17) = 1.02$, $p > 0.05$, suggesting tolerance expression in the ethanol groups (see Fig 12). Mean temperatures for all groups upon receiving test probes during the test phase are presented in Figure 13. A mixed-factor two-way ANOVA indicated between-group differences, $F(6, 17) = 4.77$, $p < 0.001$ and a group X time interaction effect, $F(102) = 1.50$, $p < 0.01$. A Tukey HSD post-hoc analyses further indicated that these group differences existed

between group S-e20% and all other groups with the exception of group S-s and S-e5%. These data suggest the initial effect of ethanol given to this group on test day induces hypothermia compared with tolerant groups given ethanol probes. This demonstrates that the 0.6 g/kg test probe of ethanol causes hypothermia even when infused as a small dose over a quick infusion. Similarly, temperature means for group S-e5% during testing differed from those receiving ethanol training and tested with DOCs, i.e. groups E-e5%, E-e10%, and E-e20%.

As is clear from Figure 13, there is evidence for demonstrations of CCRs expressed as increased temperature in ethanol-tolerant subjects given ethanol probes during the test phase. The Tukey HSD indicated that temperature means of group E-e5% and E-e10% are significantly higher than those of the baseline control (S-s) suggesting conditional hyperthermia, $p < 0.005$. A hyperthermic trend is demonstrated in group E-e20% as well although it does not reach statistical significance. Despite a dramatic increase in temperature of groups E-e5% and E-e10%, it is unclear whether interoceptive cues or environmental cues are mediating CCRs. The E-s group, designed to rule out the possibility that CCRs are actually mediated by environment versus internal drug cues, does not differ from S-s and S-e5%, $ps > 0.05$. Furthermore, there are no temperature differences between the environmental cue control group (E-s) and interoceptive groups (E-e5%, E-e10%, and E-e20%), $ps > 0.05$. And as environmental cues are continually available to all groups over training and test phases, there is no current way of ascertaining whether hyperthermic responses in the groups E-e5% and E-e10% are mediated by DOCs or exteroceptive stimuli.

Temperature, difference scores for each group when looking at changes from baseline day 4 to the test phase produce similar results as between-group temperature comparisons during the test phase as can be seen in Figure 14. Temperature increases from baseline 4 on test day are indicated by lines above 0. As predicted, groups E-e5% ($F(1, 17) = 7.66$, $p < 0.001$) and E-e10% ($F(1, 17) = 7.00$, $p < 0.001$) demonstrate hyperthermic responses when presented with DOCs during the test phase as compared to their temperature data on baseline day 4 when receiving saline. Despite increases from baseline, difference scores between these groups and controls, including E-s, do not reach statistical significance, $p < 0.05$, as is indicated by a mixed-factor ANOVA. Thus, increases in temperature from baseline to DOC exposure during testing of groups E-e10% and E-e5% may be the result of interoceptive conditional stimuli or environmental cues. This is particularly of question in that difference scores in the control group assessing environmental cues in the absence of ethanol show no more change than groups E-e5% and E-e10%. E-s also demonstrates a trend of temperature increase during the test phase as compared to baseline day 4 as well, and does not differ from the S-s control (see Fig. 14). Due to overlap of group E-s and baseline control S-s, and overlap of group E-s, E-e5% and E-e10%, it is unclear whether internal or external cues are mediating increases in temperature activity on test day versus baseline.

General Discussion

Previous findings suggest that morphine DOCs come to elicit CCRs (Cepeda-Benito & Short, 1997; Kim et al., 1999). The current experiments have evaluated the role of alcohol-onset cues in eliciting a CCR of hyperthermia. Although

training subjects on longer ethanol infusions (approximately 45 min) in Experiment 1D rather than the original 20 min seems to strengthen this effect, significant test results have not been demonstrated. Because alcohol-onset cues have never been assessed in this manner, with this route of ethanol administration, a sufficient probe parameter has not yet been determined. Also, because the current data suggest no differences between groups utilized to assess the role of intra-administration influences (i.e. E-e5%, E-e10%, E-e20%) and environmental factors (group E-s), future procedures should focus on teasing apart and isolating these cues. Despite a general trend in hyperthermia compared with control groups and baseline temperature data, there is a lack of statistical evidence linking intra-administration associations with heightened increases in temperature.

Although group means at the end of the training phase demonstrate tolerance development to alcohol's hypothermic effects, there is evidence to suggest that some subjects in the present designs, based on individual subject data, do not recover an increase in body temperature over training. Thus, perhaps a longer tolerance development period is necessary to efficiently examine CCRs. In Chapter 3, the training of subjects is carried out until tolerance is displayed in subjects and is varied for each experiment depending on the progression of tolerance. In these designs, we continued to assess the role of alcohol-onset cues by using a tilting plane apparatus. Because ethanol has been shown to produce an ataxic effect, a loss of motor coordination, this procedure is aimed at examining a hypertaxic response as a conditional compensatory response elicited by alcohol-onset cues.

Chapter 3: The Examination of Hypertaxia as a CCR Elicited in Response to Alcohol-Onset Cues

The results summarized in Chapter 2 indicate that although subjects show an increase in temperature in response to various test probes of ethanol, there are no reliable differences between the intra-administration groups and the E-s group used to test CCRs elicited by environmental cues. Thus, it is unclear whether interoceptive mechanisms are fully responsible for increased temperatures in experimental subjects. In the experiments in this chapter we evaluated the contribution of DOCs to tolerance to the ataxic effect of ethanol. Ataxia was measured with the tilting-plane procedure (see Larson & Siegel, 1996). Rats were placed in one end of a box as it was mechanically inclined at increasing angles. The degree of inclination at which the animal slips is a measure of ataxia. A CCR of alcohol's motor coordination impairment is expressed as hypertaxia or the heightened ability to maintain balance in a tilting plane device (Larson & Siegel, 1996).

Experiment 2A

Method

Subjects. The subjects were 22 experimentally naïve, Long Evans male rats (Charles River, Quebec) weighing between 300-325g at the time of surgery. They were maintained on a 12 hour light:dark cycle (lights on 0700) and given free access to food and water.

Surgical Preparation. All subjects were anesthetized with a ketamine and xylazine cocktail and then implanted with intra-gastric catheters using a modification of a procedure described by Cox (1990). The intra-gastric catheters were made from silastic

tubing (0.76 mm x 1.65 mm) and were approximately 20 cm in length. Each catheter consisted of a 20 gauge needle going directly into the tubing on one side and two balls made of silastic glue, approximately one cm apart, on the other. The outermost ball was inserted directly into the stomach, while the other served as an anchor on the outside. Once implanted, the catheter was held firmly in position by purse-string sutures. From the stomach suture, the tubing was run under the shoulder blade and extended around to the back of the neck. The end of the needle, anchored under the skin with dental cement and mesh, was secured at the back of the neck and protruded through the skin. The opening of the needle was, then, sealed with a plastic lid.

Drugs

A 56% ethanol solution was prepared, by volume, from 100% ethanol and 0.9% sodium chloride solution.

Apparatuses

Infusion chambers. All ethanol infusions were given in one of five experimental chambers the same as described in experiments 1A-1D. A syringe pump (Sage Model 341A) was located at the top of the chamber next to a small opening which permitted the tubing to run from the syringe pump into the animal chamber. Connected to the syringe pump was a 10-cc syringe, attached to Masterflex Tygon tubing. A plastic connector was attached at the end of the tubing in the animal chamber in which the animals' catheters were securely connected to the Masterflex tubing. During a 20 min ethanol administration, the syringe pumps delivered infusions at a rate of 0.20 ml. per min.

Tilting plane apparatus. A tilting plane apparatus, housed in a room separate from the infusion chamber room, was used to measure subjects' ataxia. The apparatus was constructed of clear Plexiglas (60 cm long X 18 cm wide X 30 cm high). One 18 cm side of the apparatus was attached to a horizontal platform. The other unhinged side could be made to gradually elevate (4 deg/sec) by the operation of a motor. When the motor was operated, the unhinged side of the apparatus inclined upwards at a rate of 4 degrees per sec. The experimenter terminated the tilt of the apparatus when the rat began sliding toward the hinged side of the apparatus.

To assess ataxia, the subject was placed on the non-hinged side of the tilting plane apparatus. The apparatus was then elevated, and the degree of inclination at which the animal slipped toward the hinged side of box was noted. A protractor fixed to the pivoting point of the hinged side of the apparatus was used to determine the angle at which the animal displayed ataxia and slipped; the smaller the angle of slip, the more impaired the subject's coordination.

Procedure

Baseline. Seven days following intra-gastric surgery, all subjects were taken from their home cages, weighed, and placed in the tilting plane apparatus. Three pre-infusion ataxia scores were measured for subjects every 5 min in which three slip scores were measured. The mean of these three scores was calculated. The animals were then transported to the infusion chambers where they were given a 5 g/kg saline infusion, over approximately 20 min. Following the saline infusions, all subjects were placed, once again, in the tilting plane apparatus where three post-infusion ataxia measures were taken

at 5 min intervals. An average post score was calculated from the three ataxia scores recorded for each subject. The subject's average pre-score was subtracted from the average post-score to derive an overall ataxia score (i.e. impairment after the infusion compared to before the infusion).

Training Phase. During the training phase of the experiment, all subjects were treated in a manner identical to that of baseline days. However, instead of receiving physiological saline, rats received intra-gastric infusions of ethanol for 20 min. Subjects received a dose of 3 g/kg on training day 1 and 4 g/kg on training day 2. On all subsequent days, rats received intra-gastric infusions of 5 g/kg ethanol. Ataxia scores were calculated in a manner identical to that used during baseline. This procedure was repeated daily for fifteen consecutive days at which point tolerance to ethanol's ataxic effect became noteable. On training day 15, subjects were split into three equal groups based on previous ataxia scores. Of the 22 subjects, 7 were designated to the E-e10% group, 8 to the E-e20% group, and the remaining 7 rats were assigned to group E-s.

Test Phase I and II. Immediately following the training phase of the experiment, all subjects were taken from their home cages, weighed, and given three pre-infusion ataxia assessment trials in the manner previously described during baseline and the training phase. The subjects were placed in the infusion chambers and given one of three small infusions. The E-e10% rats received an ethanol infusion of 0.5 g/kg for approximately 2 min. The E-e20% subjects received 1 g/kg for 4 min. And the E-s group received a 0.5 g/kg saline infusion over a 2 min period. The infusion rate of 0.20 ml/min remained constant for all subjects during the testing phases. Immediately following test

infusions, all subjects were transported back to the tilting plane environment in which three post-infusion ataxia measurements were taken at 5 min intervals. As previously conducted during baseline and the training phase, an overall ataxia score was taken for each subject by subtracting the average pre score from the average post score. The entire procedure was repeated 24 hours later in test phase II.

Results and Discussion.

An ataxia score was calculated for each subject over the 15 days of the ethanol training phase by subtracting an average pre-infusion score from the subject's average post-infusion scores; lower ataxia scores denote greater levels of ethanol-induced impairment. As all subjects received the identical experimental treatment during the training phase, an average ataxia score was calculated for each training day and is depicted in Figure 15. As might be expected, ataxia scores decreased on training day 3 when the dose was increased to 5 g/kg from 3 g/kg and 4 g/kg on training days 1 and 2. Also illustrated in Figure 15 are average ataxia scores during the training phase, which demonstrate tolerance acquisition expressed as there are some improvements in ataxia scores over the latter fifteen days of training.

Following the tolerance acquisition phase, subjects were split into three groups. A one-way ANOVA was conducted to ensure ataxia scores among groups were equal prior to the testing phase. As is presented in Figure 16, the three groups' overall ataxia scores were not significantly different from each other on the final day of training, $F(2,19) = 0.62$, $p > 0.05$. Evidence of CCRs in response to ethanol-onset cues were predicted to be elicited in groups E-e10% and E-e20% due to signalling of DOCs during the testing

phases. It was also predicted that pharmacological cues overshadowing environmental cues in the E-s group would prevent the subjects from relying on contextual cues in tolerance expression and elicitation of CCRs. Thus, a small saline probe was predicted to elicit no improvement in motor coordination (i.e. increased ataxia score) for the E-s group. As is also presented in Figure 16, there are no group differences among any of the three groups during the latter days of the training phase as well as test phases.

Figure 17 presents the data for Test Phase 1. As might be expected all subjects demonstrate increased performance on the ataxia measure after the test infusion compared to before receiving small ethanol and saline probes. A one-way ANOVA confirms no ataxia differences between groups, $F(2,19) = 0.09$, $p > 0.05$. As can also be seen in Figure 17, not only does the control receiving environmental cues (E-s) appear to show increased performance on the ataxia assessment after receiving physiological saline, there were no differences in hypertaxic responses when compared to interoceptive cue groups (E-e 10% and E-e 20%). The results of a second, identical probe administration during test phase II show a similar group trend (see Fig 18). The results of a one-way ANOVA confirmed no group differences, $F(2,19) = 0.08$, $p > 0.05$ during test phase II.

Despite previous morphine findings suggesting that exteroceptive cues are overshadowed by more salient DOCs, there is no evidence to support the notion in the present experiment (Kim et al., 1999). Paradoxically, the group relying on environmental cues during testing (group E-s) shows equal levels of hypertaxia and a larger SEM when compared to groups E-e10% and E-e20% receiving alcohol-onset cues. Because there is

no research examining the roles of DOCs in an intra-administration design, it is possible that the infusion parameters are not optimal in observing CCR-mediated hypertaxia. The conditions may not be optimal for an overshadowing effect to occur as well. Thus, as was previously conducted in Experiment 1D, the infusion duration is changed in Experiment 2B to approximately 45 min administered at a rate of 0.10 ml/min. Increasing the infusion time should allow subjects a sufficient amount of time to make an interoceptive association contributing to DOC salience in comparison to exteroceptive stimuli. Longer infusions should make alcohol-onset cues during drug administration more noticeable to subjects and, thus, more informative.

Experiment 2B

Method

Subjects. Subjects were 19 experimentally naïve, Long Evans male rats received from Charles River (Quebec) with weights ranging between 300-325 g. All subjects were maintained on a 12 hour light:dark cycle and given ad lib access to food and water.

Surgical Preparation. Subjects were implanted with intra-gastric catheters in the manner previously described in Experiment 2A.

Drugs

An ethanol solution concentrated at 66% was prepared, by volume, from 0.9% sodium chloride solution and 100% pure ethanol.

Apparatuses

The infusion chambers and tilting plane device utilized in the present study are the same as previously described in Experiment 2A. Due to an extended

infusion period, the infusion pumps were connected to a 5-cc syringe, and solutions were administered at a rate of 0.07 to 0.10 ml per min, depending on the subjects' weights.

Procedure

Training Phase. Upon recovery, one week following intra-gastric surgery, subjects were removed from their home cages, weighed, and placed in the tilting plane apparatus. Pre-infusion ataxia scores were taken three times at 30 sec. intervals. An average of the pre-scores was calculated. Following ataxia assessment, subjects were transported to the infusion chambers where they received a 6 g/kg ethanol infusion at a rate of 0.10 ml/min for approximately 45 to 50 min. Immediately following the intra-gastric infusions, subjects were placed back in the tilting planes. Four additional ataxia assessments were made post-infusion at 5 min intervals, and an average was recorded. Each subject's ataxia score was then calculated by subtracting the average post score from the average pre score. This procedure was conducted daily until tolerance development was evident over 20 days. On training day 20, subjects were split into two similar groups based on ataxia histories. Ten subjects were assigned to group E-e10% while the remaining 9 subjects were designated to group E-s.

Test Phase. Following the training phase, all subjects were removed from their home cages, weighed, and given three pre-infusion, ataxia assessments at 30 sec intervals in the manner previously performed during training. Subjects in group E-e10% were transported to the infusion chambers and given a ten percent dose of ethanol at ten percent of the original time (i.e. 0.6 g/kg in 4 min). Group E-s received a volumetrically equivalent infusion of saline over the 4 min infusion. Infusion parameters and rate

remained constant throughout the experiment. At the conclusion of the short infusions, all subjects were again placed in the tilting plane apparatus. Four post-infusion measures were recorded for each subject at 5 min intervals. The average post-infusion score was calculated, and the average pre-infusion score was subtracted from this number to derive an individual ataxia score.

Results and Discussion.

During the 20 training days, ataxia scores for individual subjects were calculated by subtracting the average of the animal's pre-ethanol infusion score from the average post-ethanol infusion score (as in the previous experiment). The average ataxia score of all subjects receiving ethanol can be seen each day for the twenty days of the training phase in Figure 19. Scores gradually improved over the final days of training indicating some evidence of tolerance development. A one-way ANOVA conducted on the final day of the training phase indicated no group differences in ataxia scores upon having split subjects into groups E-s and E-e10%, $F(1,17) = 0.003$, $p > 0.05$ (see Fig 20).

Because an extended drug infusion period should promote an effective intra-administration association among the initial drug effect and the later, larger effect, it was predicted that subjects in group E-e10% should elicit hypertaxia in response to a ten-percent ethanol probe. Conversely, because salient, interoceptive cues have previously been suggested to overshadow exteroceptive stimuli, it was further expected that group E-s, receiving no interoceptive signal during the test phase, should not demonstrate increased ataxic performance (Kim et al., 1999). Thus, E-e10% subjects' ataxia scores were expected to be considerably higher than those of group E-s. Ataxia scores during the

test phase are presented in Figure 21 and the final points of Figure 20. As can be seen, the opposite of the expectancies were demonstrated with subjects in group E-s achieving a higher ataxia score average than those of E-e10%. The ataxia scores for the two groups in the test phase, however, do not reach statistical significance as is indicated in a one-way ANOVA, $F(1,17) = 2.29$, $p > 0.05$. These findings indicate that cues signalling drug administration via the initial drug effect or environmental cues are not differing in their ability to elicit conditional hypertaxia.

It is possible that the ten percent test probe (0.60 g/kg) is a large enough dose to attenuate the CCR of hypertaxia which is countering its effects. Thus, the scores between groups E-e10% and E-s do not appear different based on motor coordination ability. This does not account for increases in performance on the tilting plane task from pre-infusion to post-infusion in E-s subjects. It becomes apparent here that mere infusion rituals and ethanol external preparatory cues are sufficient in eliciting an improvement in ataxia scores when examining pre-infusion versus post-saline infusion. This suggests that environmental cues are contributing to the ethanol tolerance development and not necessarily made to be less salient in the presence of notable DOCs. As is seen in the previous experiments, it is uncertain whether interoceptive cues are at play in eliciting increases in ataxia scores during the test phase or the animals are responding to environmental cues as is the case with subjects in group E-s. In order to more fully understand these mechanisms, other experimental groups and designs need to be added in the future to make the necessary comparisons.

General Discussion

Previous findings indicate intra-administration associations with morphine, and the present experiments were conducted to evaluate such associations with ethanol. The present data suggest that environmental cues are informative and are not being overshadowed by the small initial drug effect. Interoceptive cues, nonetheless, have been responsible for mediating heightened coordination on the ataxia assessment following a small dose of ethanol versus before receiving the drug. It can be suggested from the current findings that both exteroceptive and interoceptive cues are potentially mediating hypertaxic responses and there appears to be no overshadowing of one over the other. Groups designed to assess the role of environmental cues (E-s) and intra-administration effects resulting from DOCs (E-e5% and E-e10%) did not show marked hypertaxic differences. Furthermore, it is difficult to tease apart internal and external cues as all subjects are presented with the same environmental cues on all sessions. In order to supplement findings, other controls and experimental groups are imperative in the present designs.

Furthermore, it is possible that the current ethanol doses and probe parameters are not efficacious in eliciting observable CCRs expressed as hypertaxic responses. Because ethanol DOCs in an ethanol intra-administration design have never before been examined, it is possible that further investigation with different ethanol doses, infusion parameters, and sensitive test measures are needed to detect CCRs elicited in response to ethanol DOCs.

Concluding Remarks

For several decades there has been overwhelming evidence implicating Pavlovian conditioning as a major component involved in the expression of drug tolerance and withdrawal. Most of this research has concerned environmental cues as CSs. Exteroceptive stimuli paired with repeated drug administration, over time, elicit CRs of a compensatory nature. The presence of these stimuli contribute to tolerance or the decreased effectiveness of a drug over time. In the presence of drug-paired environmental stimuli, drug-tolerant subjects display CCRs which are opposite to the drug effect. Furthermore, the presence of these drug-linked cues in the absence of drug administration give undiluted indications of drug-opposite compensations (Subkov & Zilov, 1937). Further implications suggest that tolerance may be fully expressed in an environment previously paired with drug use and are not exhibited in novel environmental contexts; a concept termed situational specificity of tolerance (Siegel, 2001B). Based on these findings, there has been research examining the role of overdose based on the organism's ability to elicit CCRs in the presence or absence of drug-related cues. There is overwhelming support to suggest that subjects are much more vulnerable to overdose death, an indication of loss of tolerance, in unusual drug-administration circumstances versus routine ones (Siegel et al., 1982; Siegel, 2001B, Gutierrez-Gutierrez-Cebollada et al., 1994). There is additional speculation that situational specificity of tolerance may be demonstrated as a result of drug route of administration and pharmacological cues (Siegel & Kim, 2000).

In additional to the role that environmental cues have been demonstrated to play in eliciting CCRs, there is more recent evidence (from intra-administration conditioning experiments) that internal stimuli can serve as CSs. These experiments have concerned the contribution of DOCs to morphine tolerance. Intra-drug associations have been consistently demonstrated with morphine on several occasions in which an early dose of morphine triggers an opiate-opposite response of hyperalgesia to combat the associated later larger drug effect (Kim et al., 1999; Sokolowska et al., 2002). The present experiments evaluated the CS properties of ethanol DOCs.

Despite previous intra-administration findings with opiates in which a small dose of morphine produced CCRs when paired with the larger dose to follow, this effect has yet to be demonstrated with ethanol. As is discussed in Chapter 2 and Chapter 3, overall ethanol-tolerant rats trained on doses from 3 g/kg to 6 g/kg over infusions ranging from 20-50 min do not display CCRs to small ethanol probes, both in measures assessing ataxia and temperature. Also uncharacteristic of previous findings with morphine intra-administration associations is that in the previous ethanol designs there is no evidence to support overshadowing of exteroceptive cues by interoceptive cues. Increases in coordinative ability and temperature during testing phases do not differ among subjects receiving predictive pharmacological cues (i.e. a small ethanol dose) or mere environmental cues associated with ethanol administration. Furthermore, without a discrimination design with CS+ and CS- cues, it is very difficult to tease apart these environmental and internal cues. This is, in large part, due to the fact that all subjects,

whether given interoceptive signals or not, were exposed to environmental cues present in the infusion procedures.

The disparity of results in morphine and ethanol DOCs may be the result of the different pharmacokinetic properties of the drugs. Differences in physiological and behavioral effects of the drugs may yield differences in intra-association cues and conditioning responses. In addition, an IV route of administration is employed in previous morphine studies assessing morphine DOCs. This route usually causes the drug to take effect immediately. Under an a instantaneous drug effect schedule, the experimenter can then knowledgeably control the slow rate in which the drug will be experienced through manipulation of the infusion time. An IG route of administration used in the present ethanol experiments requires a slightly longer time of absorption through the stomach compared with IV (Brands et al., 1998). A slow infusion rate precipitates the lengthiness of the drug effect, and there is question as to what rate is appropriate in creating a slow and steady drug effect. Thus, intra-administration parameters indicating an optimal rate/dose in eliciting CCRs has yet to be determined with alcohol. Future designs paralleling previous intra-administration morphine designs may need to employ IV infusions, although this route of ethanol administration is a less common drug route used in humans. In addition, because intra-administration associations have never before been investigated with ethanol, it is possible that other doses, test probes, and infusion parameters may need to be more fully explored in order to find parameters sufficient to elicit CCRs resulting from alcohol-onset cues.

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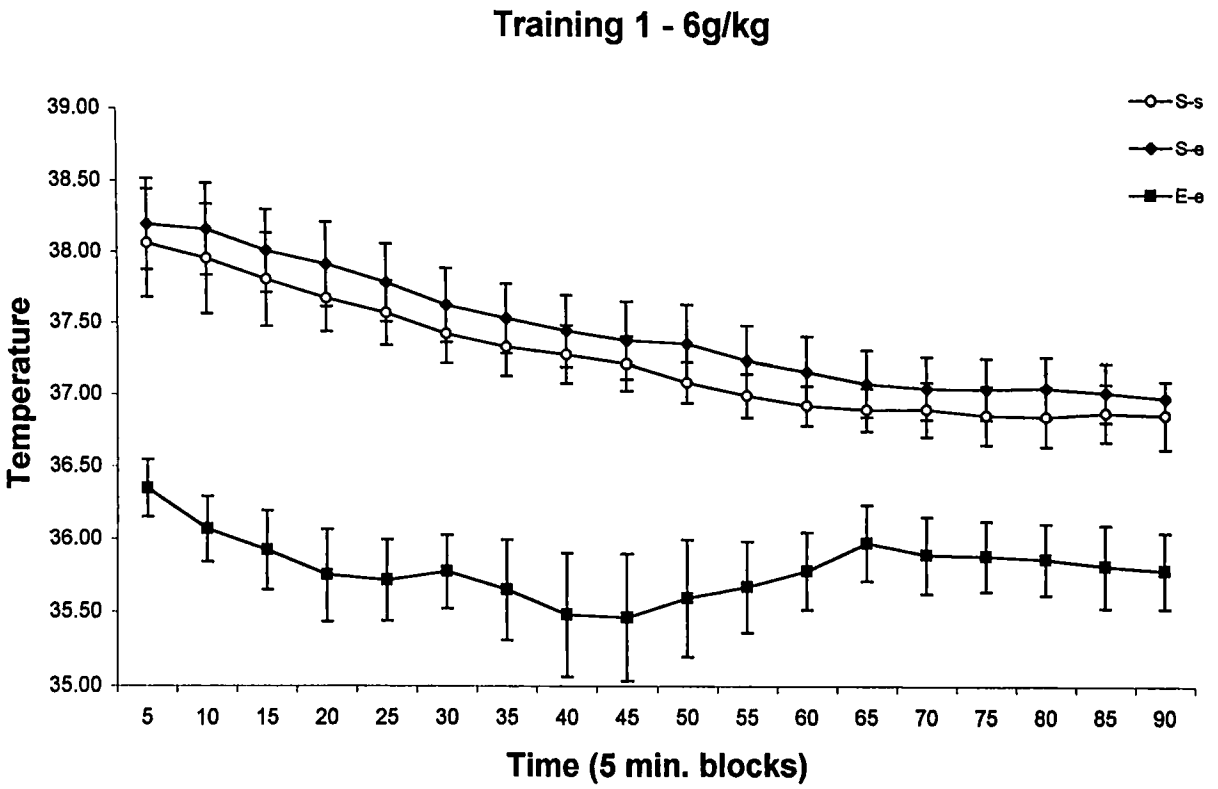
Figure 1


Training 1 - 6g/kg
S-s
S-e
E-e
Temperature
39.00
38.50
38.00
37.50
37.00
36.50
36.00
35.50
35.00
5
10
15
20
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45
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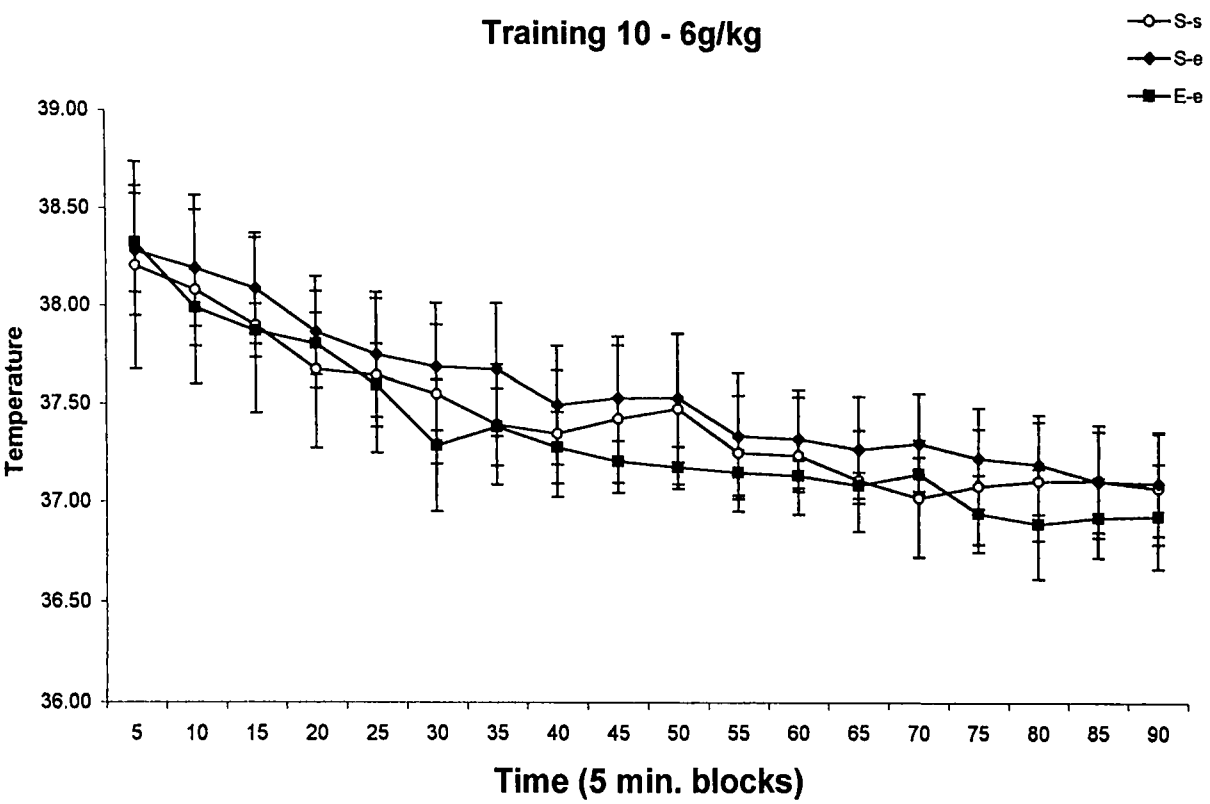
65
70
75
80
85
90
Time (5 min. blocks)

Figure 2


Training 10 - 6g/kg
S-s
S-e
E-e
Temperature
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38.50
38.00
37.50
37.00
36.50
36.00
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
Time (5 min. blocks)

Figure 3

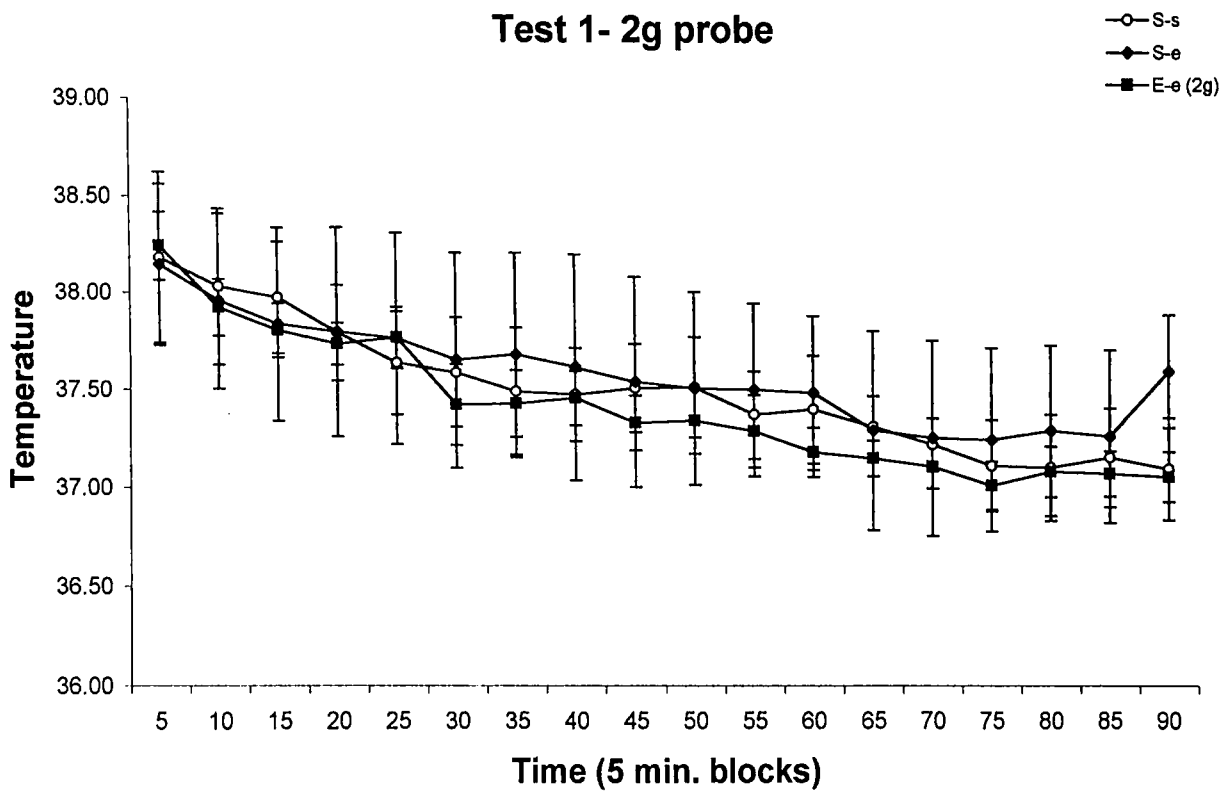

Test 1- 2g probe
S-s
S-e
E-e (2g)
Temperature
39.00
38.50
38.00
37.50
37.00
36.50
36.00
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
Time (5 min. blocks)

Figure 4

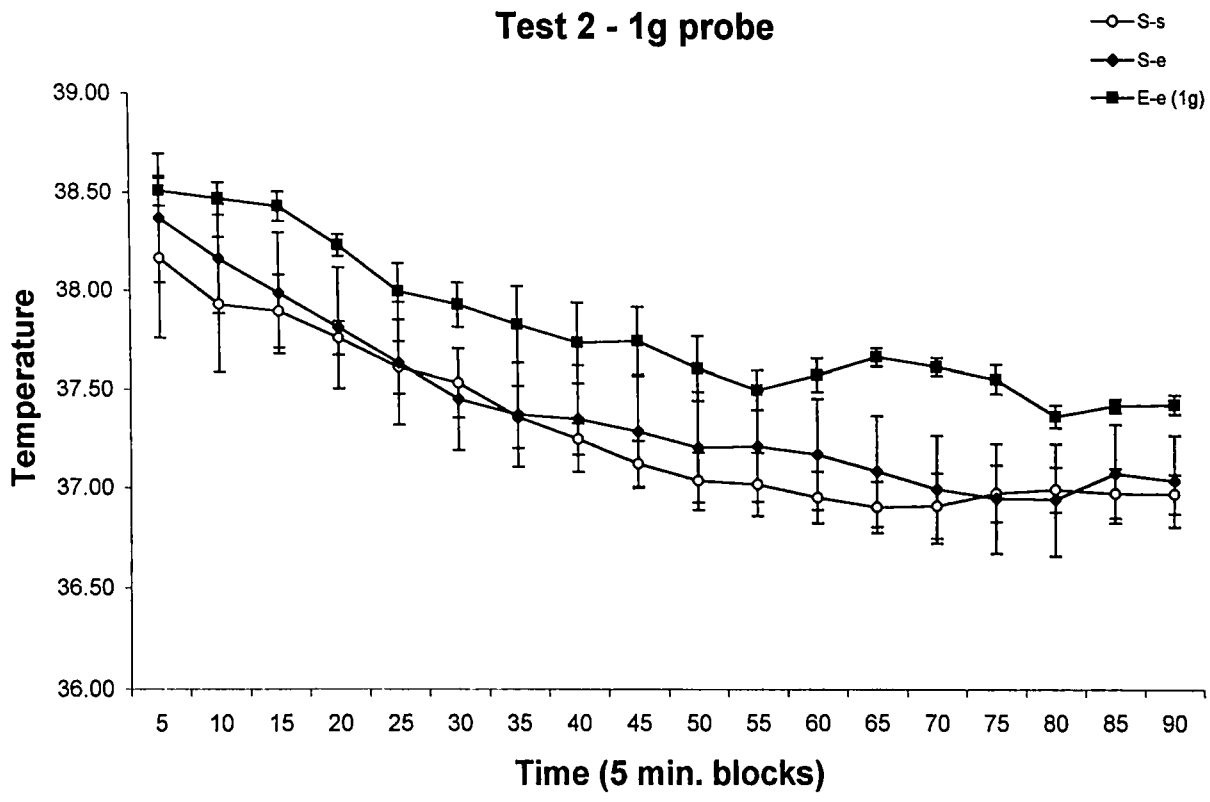
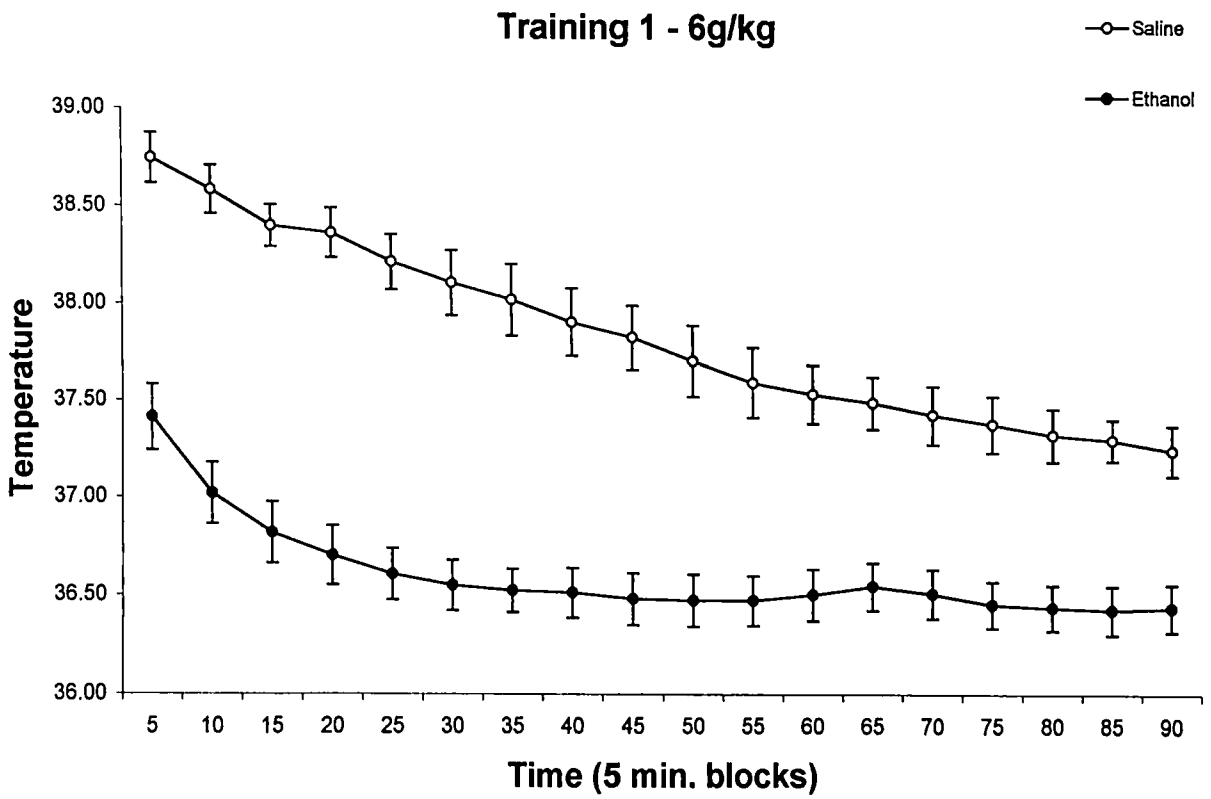

Test 2 - 1g probe
S-s
S-e
E-e (1g)
39.00
38.50
38.00
37.50
37.00
36.50
36.00
Temperature
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
Time (5 min. blocks)

Figure 5


Training 1 - 6g/kg
Saline
Ethanol
Temperature
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38.00
37.50
37.00
36.50
36.00
5
10
15
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30
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60
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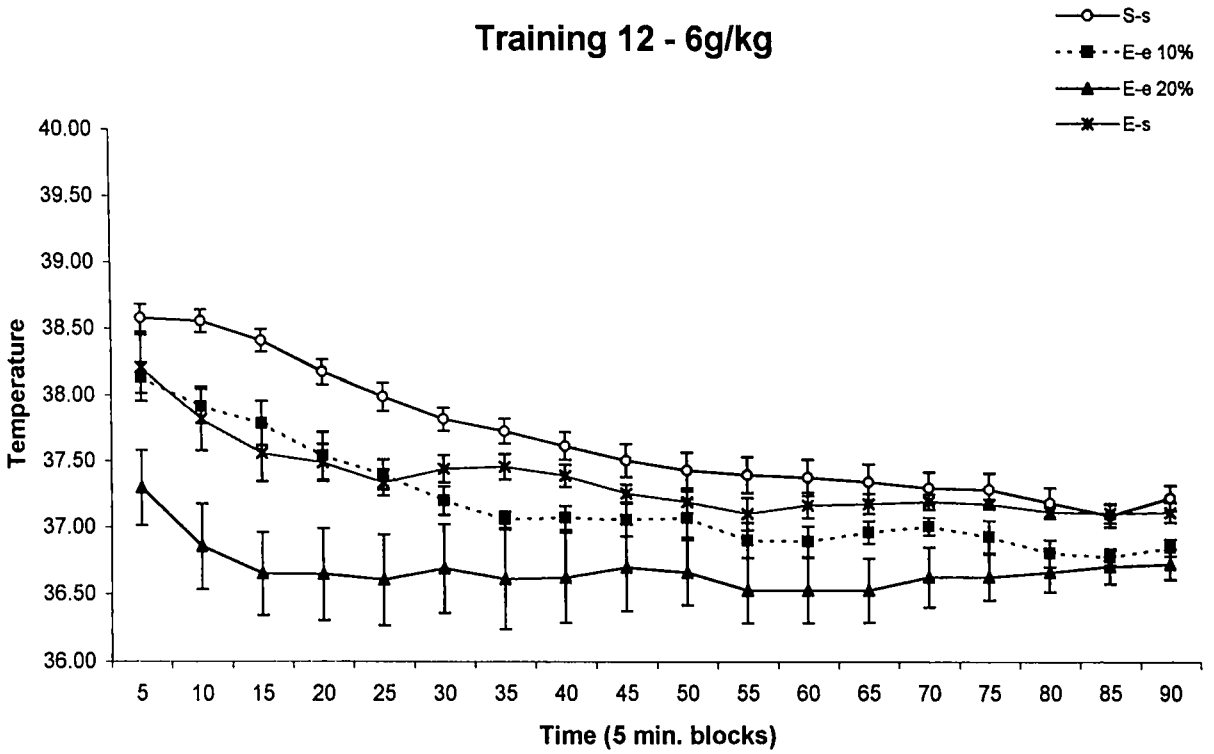
70
75
80
85
90
Time (5 min. blocks)

Figure 6


Training 12 - 6g/kg
S-s
E-e 10%
E-e 20%
E-s
Temperature
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39.50
39.00
38.50
38.00
37.50
37.00
36.50
36.00
5
10
15
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25
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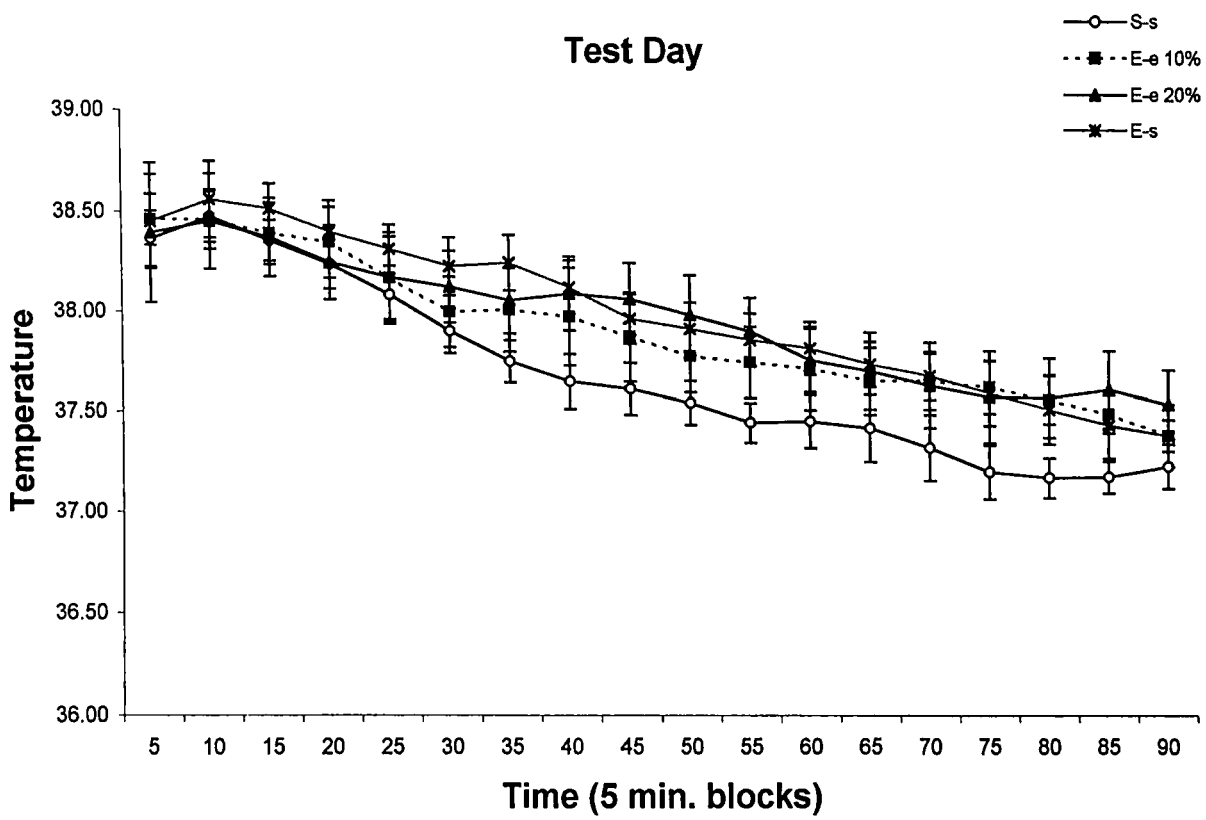
55
60
65
70
75
80
85
90
Time (5 min. blocks)

Figure 7


Test Day
S-s
E-e 10%
E-e 20%
E-s
Temperature
39.00
38.50
38.00
37.50
37.00
36.50
36.00
5
10
15
20
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45
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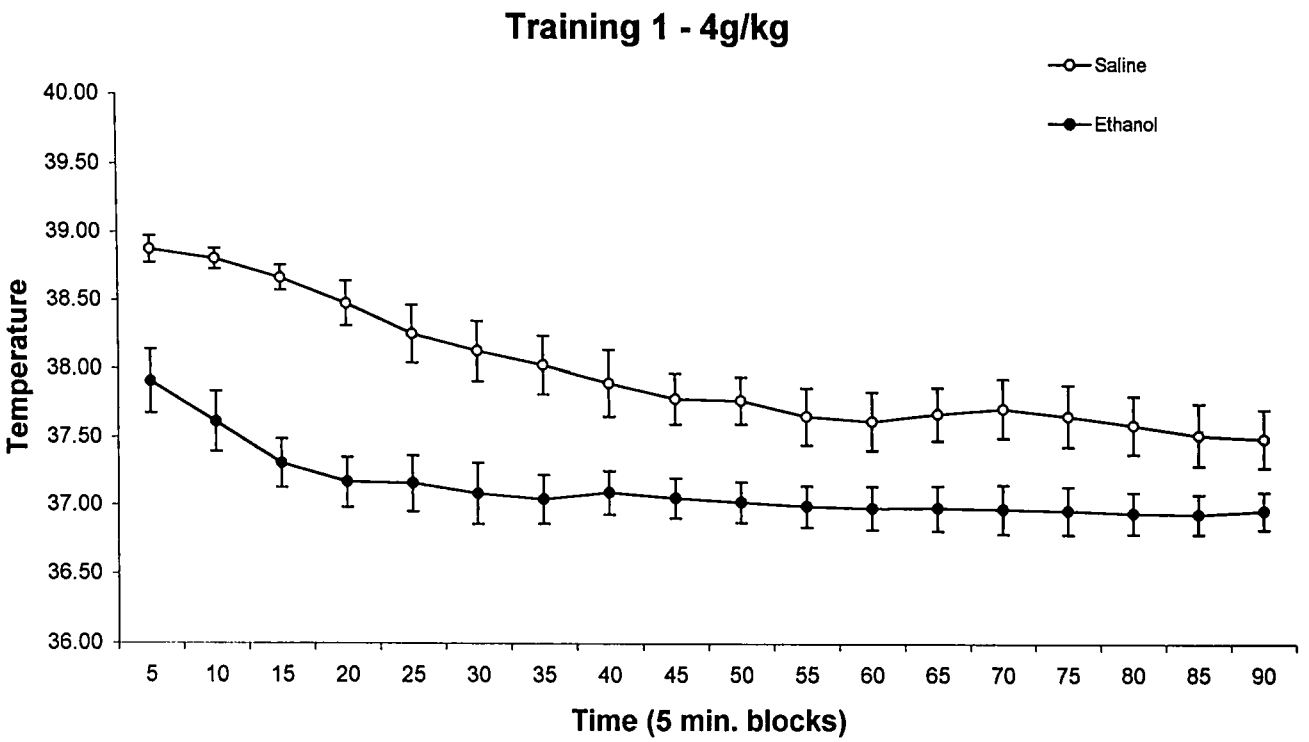
70
75
80
85
90
Time (5 min. blocks)

Figure 8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Saline
Ethanol
Temperature
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39.00
38.50
38.00
37.50
37.00
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36.00
5
10
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55
60
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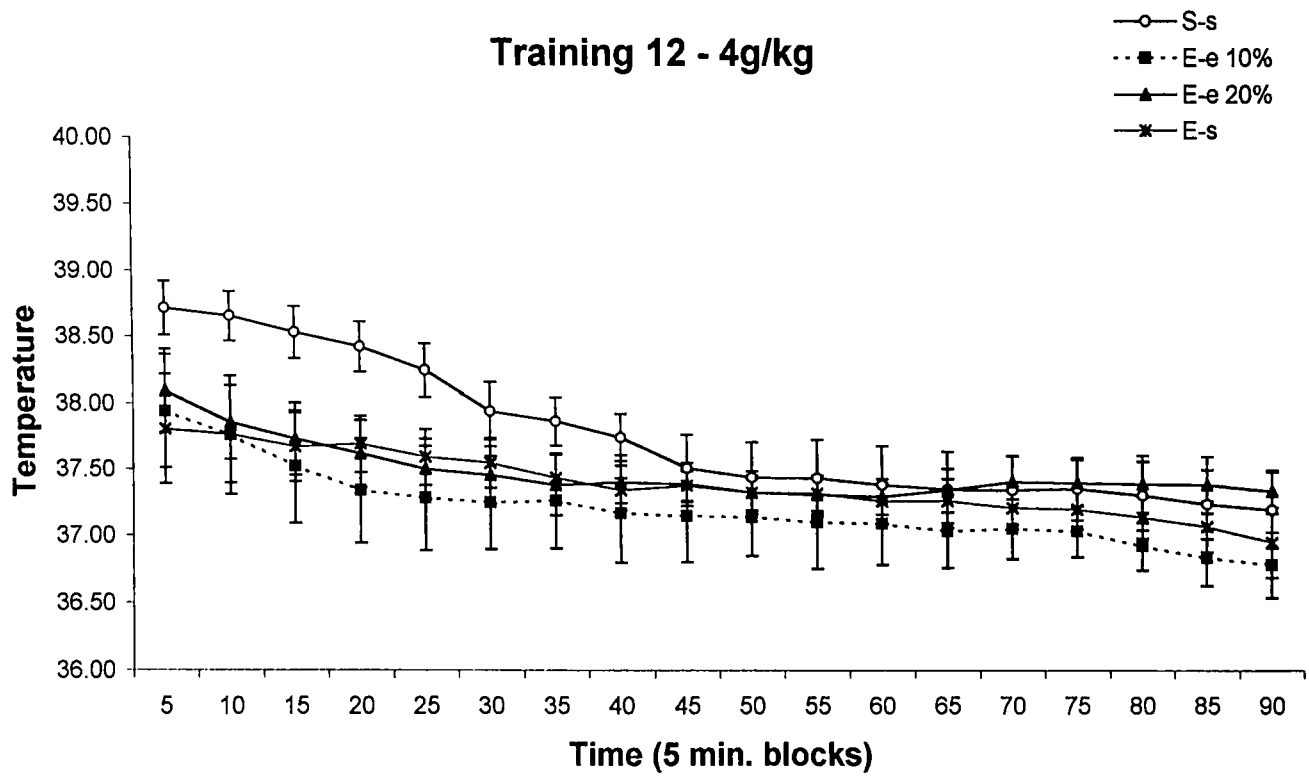
70
75
80
85
90
Time (5 min. blocks)

Figure 9


Training 12 - 4g/kg
S-s
E-e 10%
E-e 20%
E-s
Temperature
40.00
39.50
39.00
38.50
38.00
37.50
37.00
36.50
36.00
5
10
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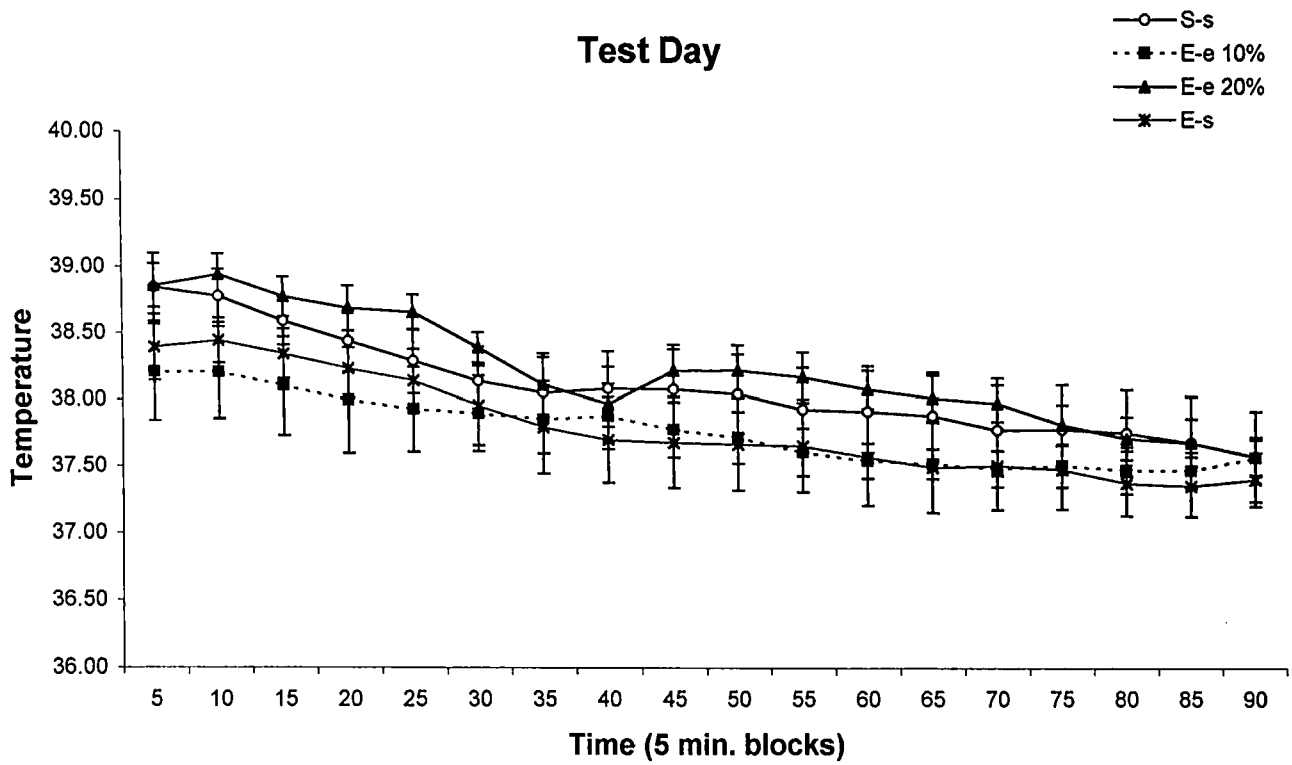
75
80
85
90
Time (5 min. blocks)

Figure 10


Test Day
S-s
E-e 10%
E-e 20%
E-s
Temperature
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39.50
39.00
38.50
38.00
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37.00
36.50
36.00
5
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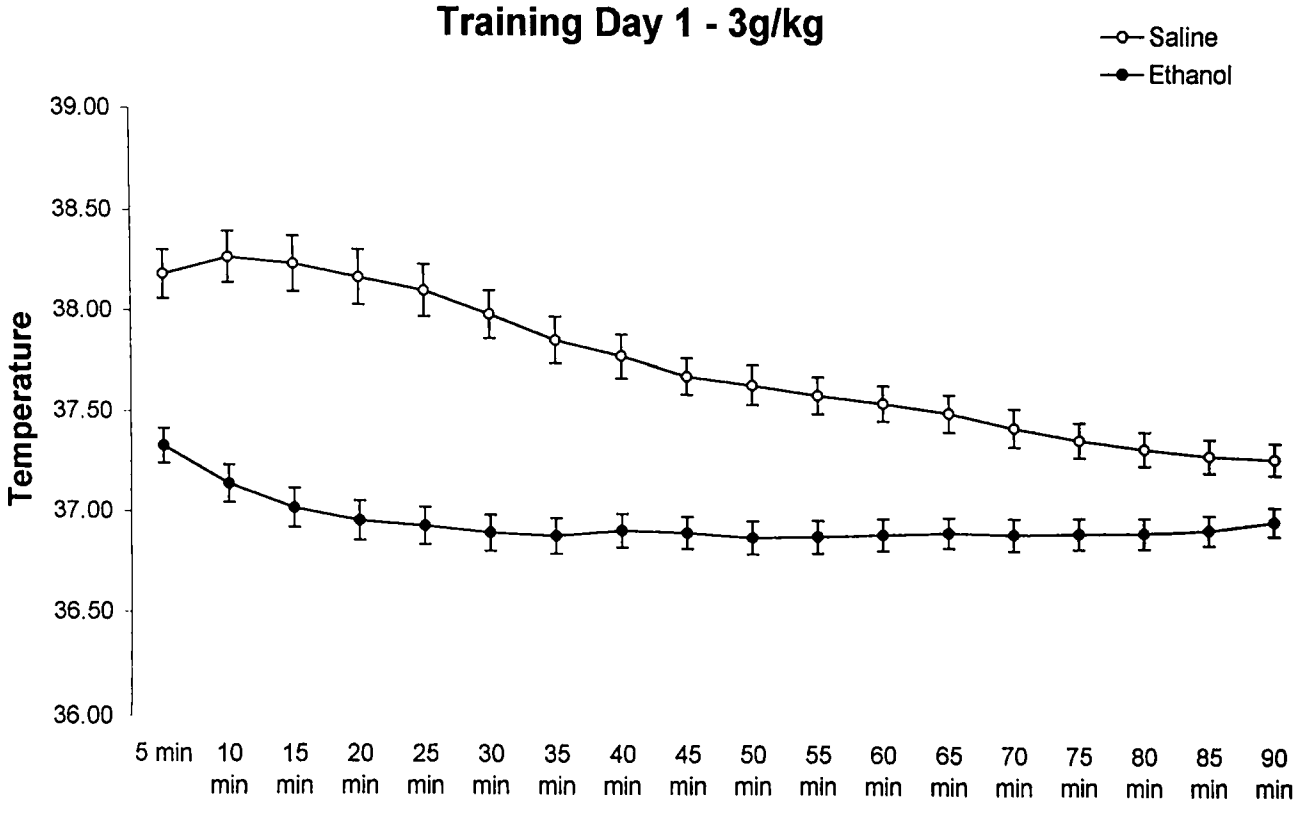
Time (5 min. blocks)

Figure 11


Training Day 1 - 3g/kg
Saline
Ethanol
Temperature
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38.00
37.50
37.00
36.50
36.00
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10 min
15 min
20 min
25 min
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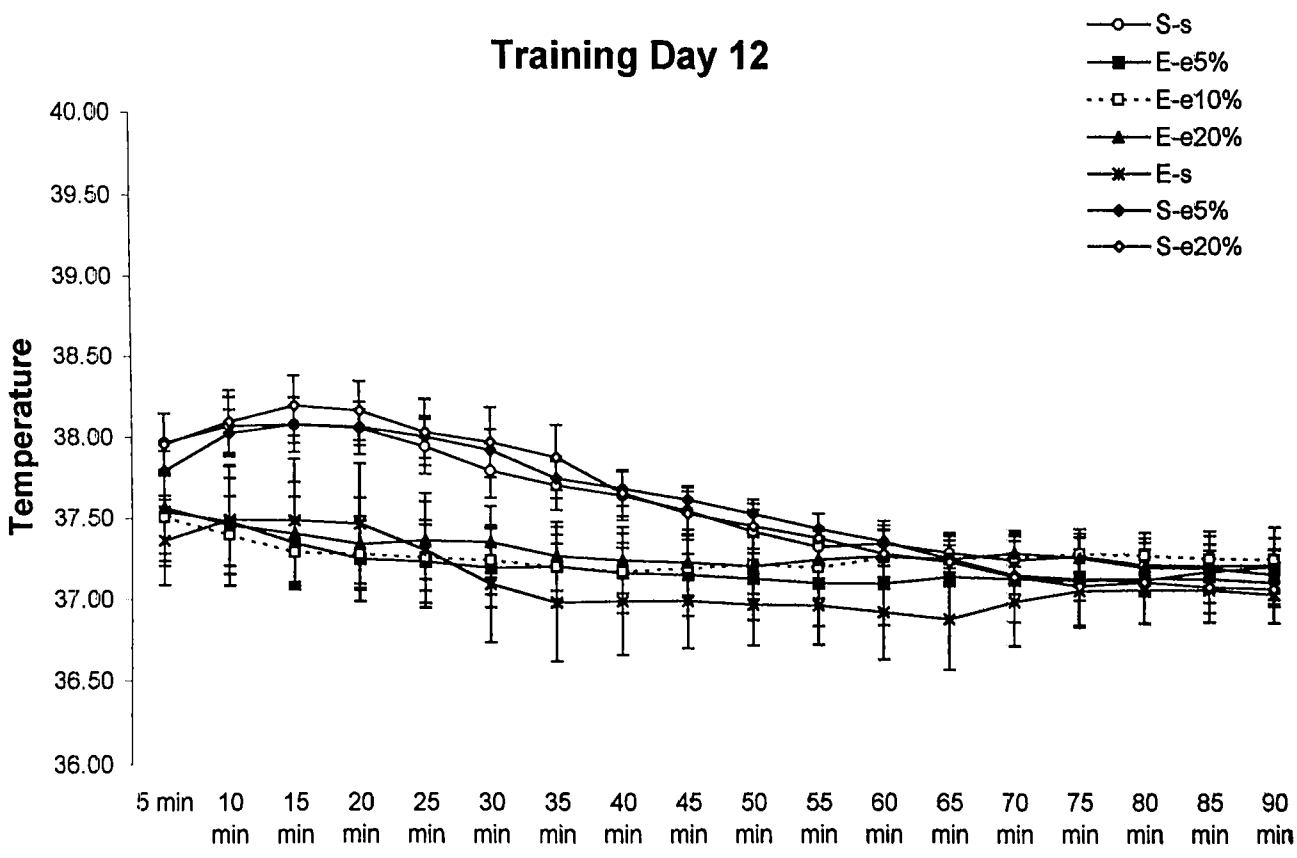
75 min
80 min
85 min
90 min

Figure 12


Training Day 12
S-s
E-e5%
E-e10%
E-e20%
E-s
S-e5%
S-e20%
Temperature
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39.50
39.00
38.50
38.00
37.50
37.00
36.50
36.00
5 min
10 min
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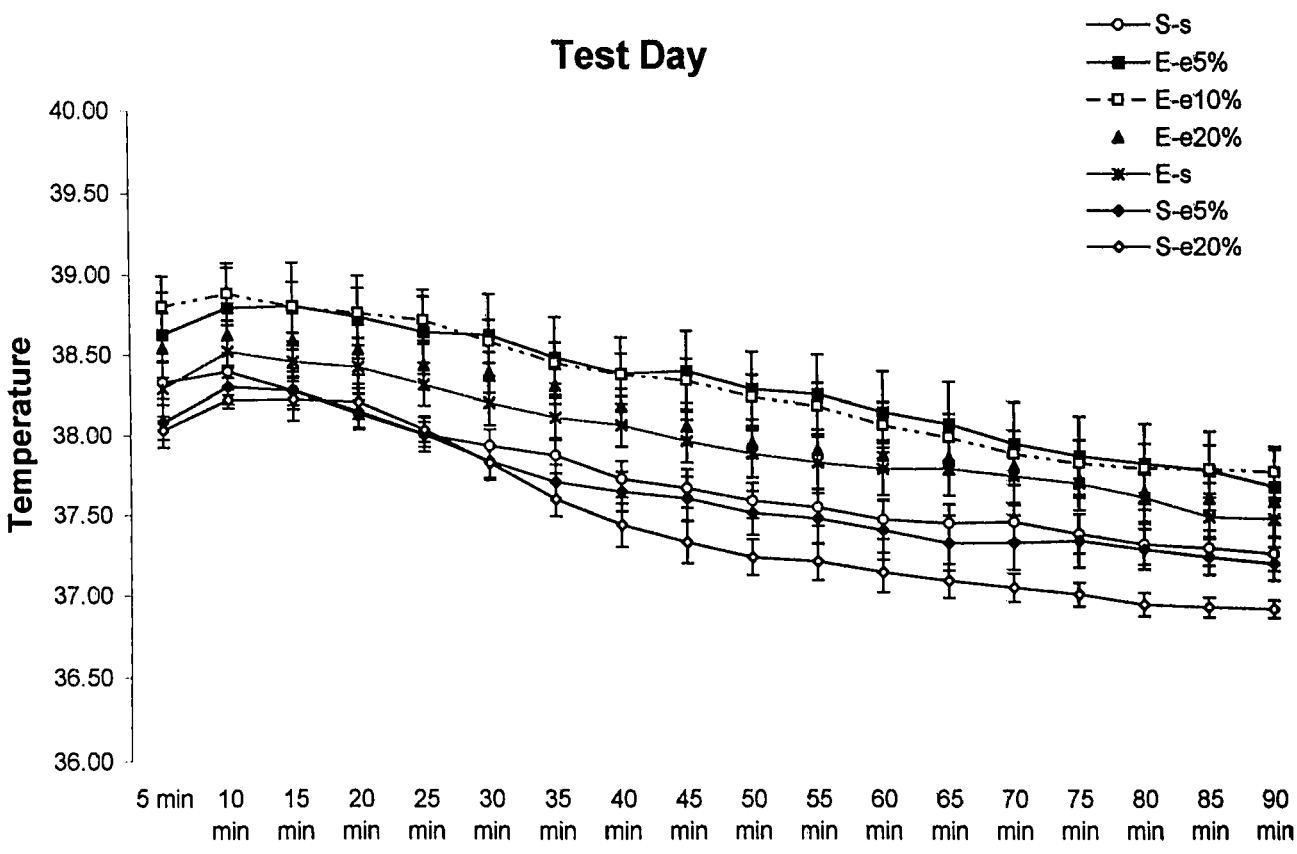
Figure 13


Test Day
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E-e10%
E-e20%
E-s
S-e5%
S-e20%
Temperature
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39.50
39.00
38.50
38.00
37.50
37.00
36.50
36.00
5 min
10 min
15 min
20 min
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90 min

Figure 14

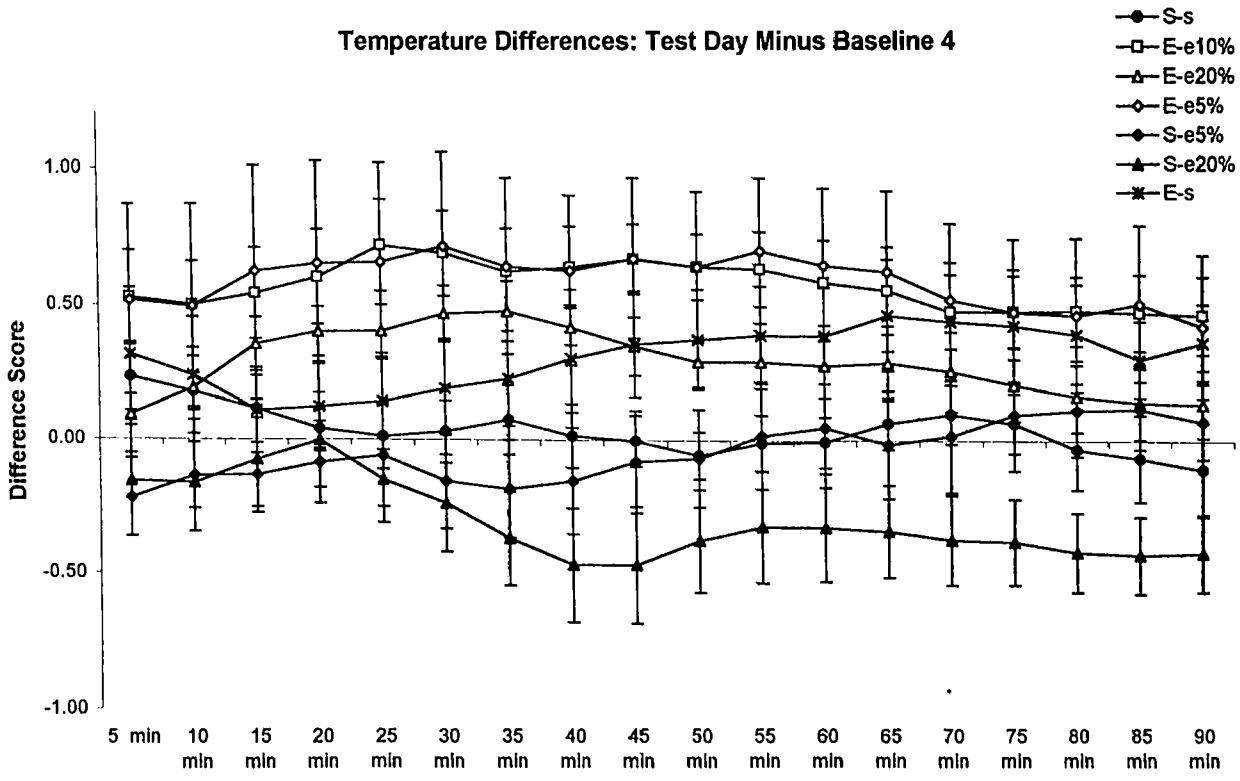

Temperature Differences: Test Day Minus Baseline 4
S-s
E-e10%
E-e20%
E-e5%
S-e5%
S-e20%
E-s
Difference Score
1.00
0.50
0.00
-0.50
-1.00
5 min
10 min
15 min
20 min
25 min
30 min
35 min
40 min
45 min
50 min
55 min
60 min
65 min
70 min
75 min
80 min
85 min
90 min

Figure 15

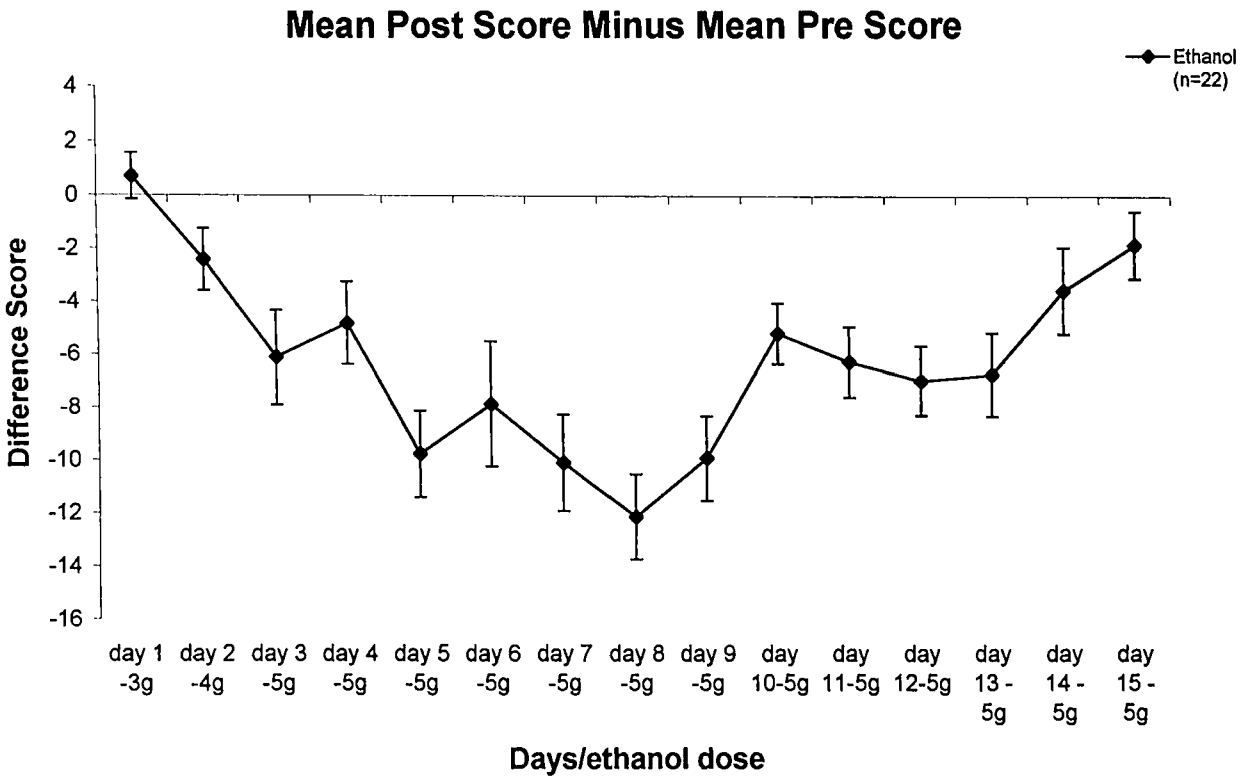

Mean Post Score Minus Mean Pre Score
Ethanol (n=22)
Difference Score
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
day 1 -3g
day 2 -4g
day 3 -5g
day 4 -5g
day 5 -5g
day 6 -5g
day 7 -5g
day 8 -5g
day 9 -5g
day 10-5g
day 11-5g
day 12-5g
day 13 - 5g
day 14 - 5g
day 15 - 5g
Days/ethanol dose

Figure 16

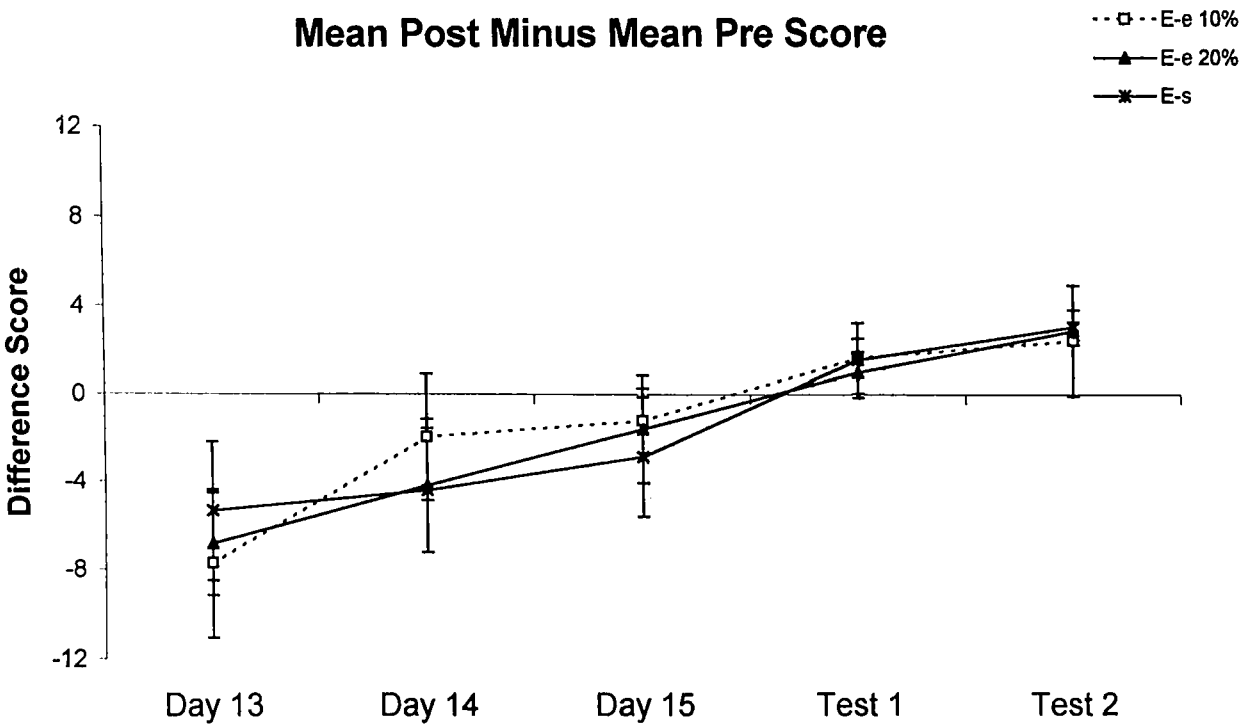

Mean Post Minus Mean Pre Score
E-e 10%
E-e 20%
E-s
Difference Score
12
8
4
0
-4
-8
-12
Day 13
Day 14
Day 15
Test 1
Test 2

Figure 17

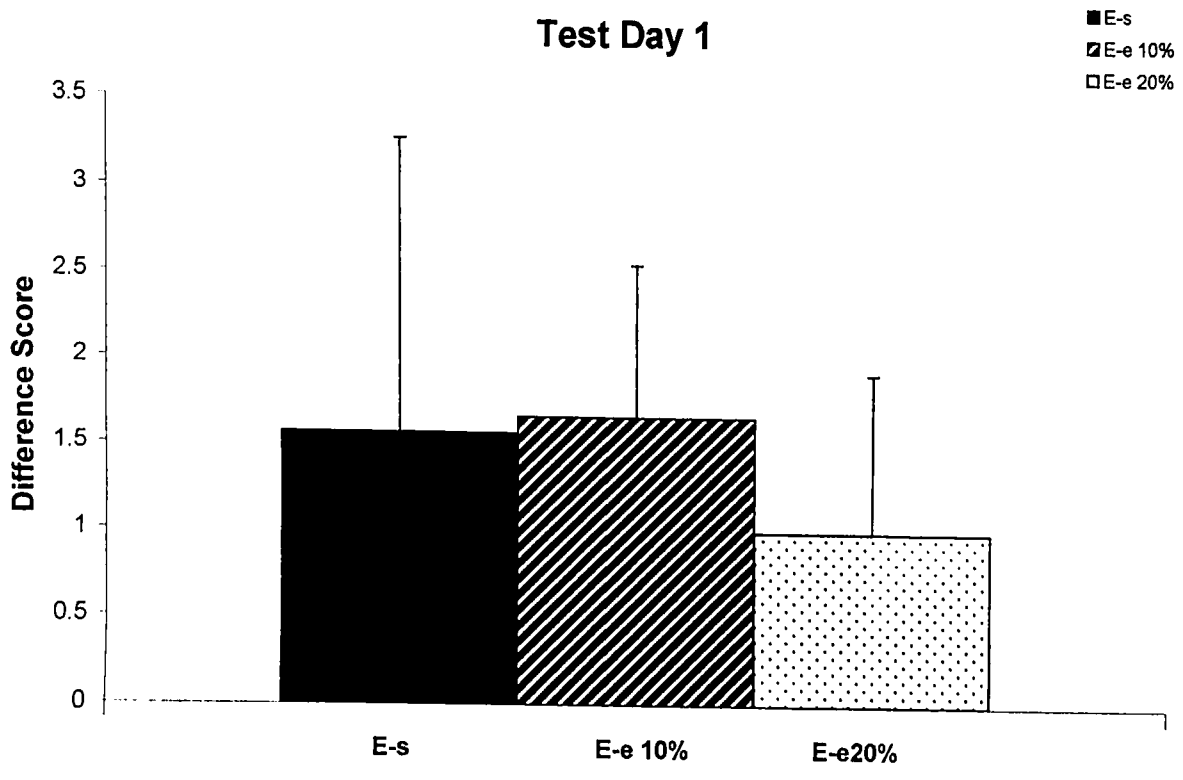

Test Day 1
E-s
E-e 10%
E-e 20%
Difference Score
3.5
3
2.5
2
1.5
1
0.5
0
E-s
E-e 10%
E-e20%

Figure 18

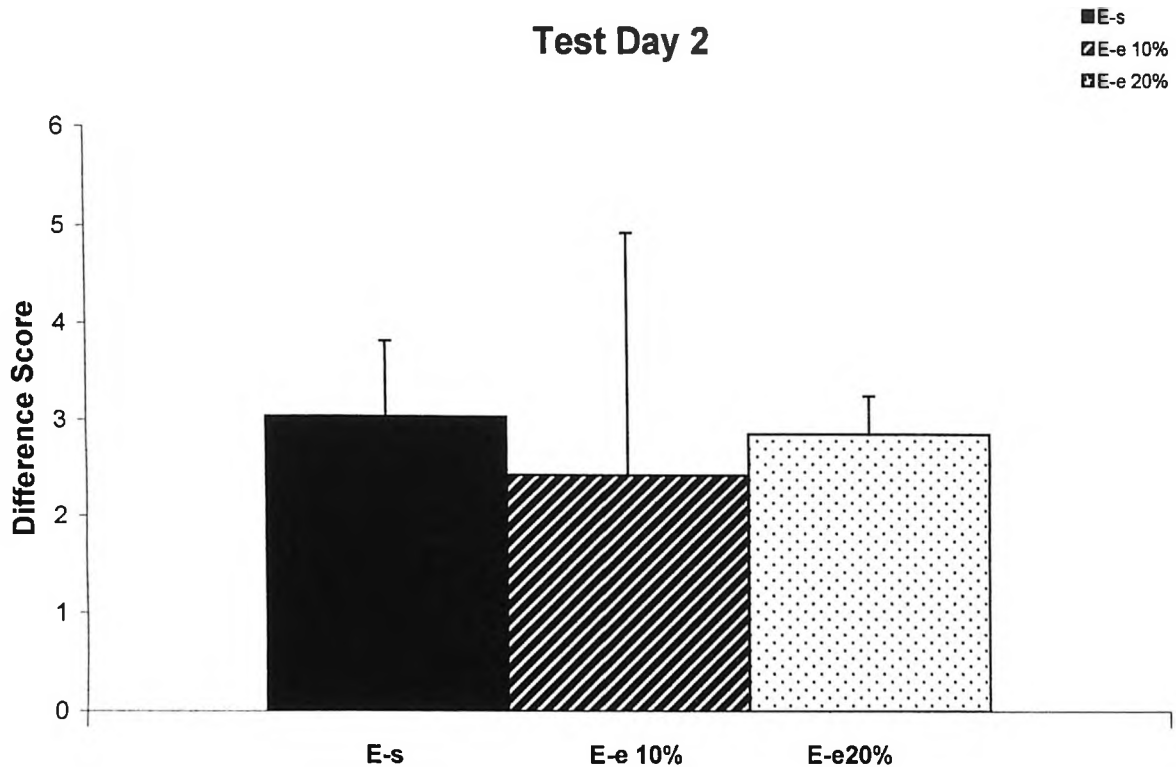

Test Day 2
E-s
E-e 10%
E-e 20%
Difference Score
6
5
4
3
2
1
0
E-s
E-e 10%
E-e20%

Figure 19

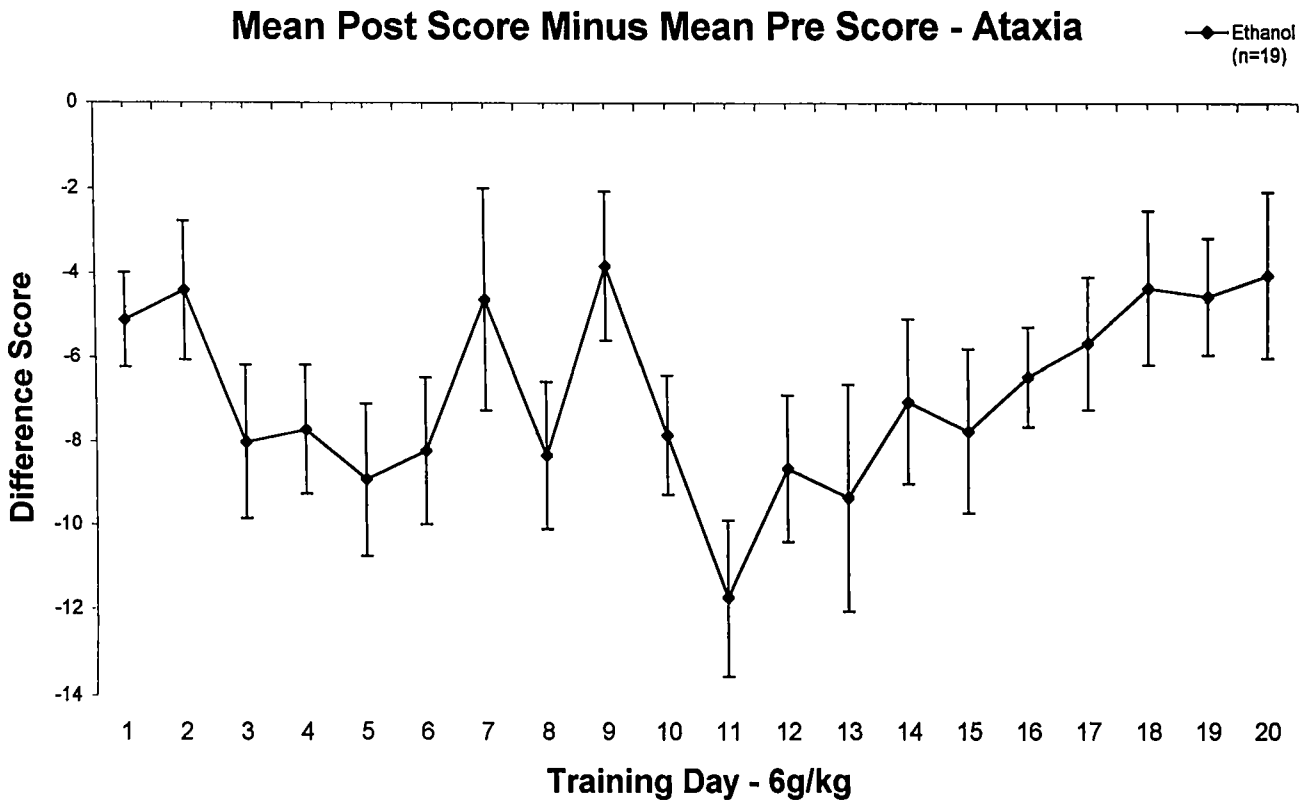

Mean Post Score Minus Mean Pre Score - Ataxia
Ethanol (n=19)
Difference Score
0
-2
-4
-6
-8
-10
-12
-14
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Training Day - 6g/kg

Figure 20

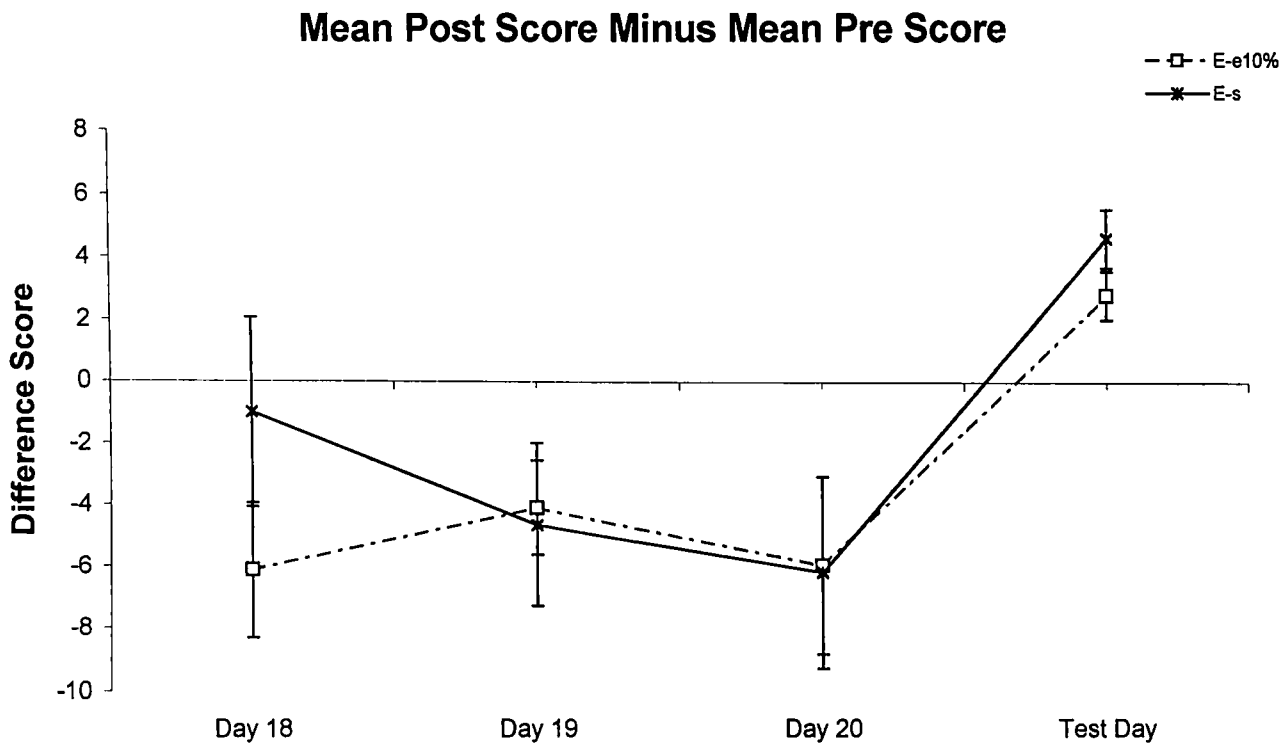
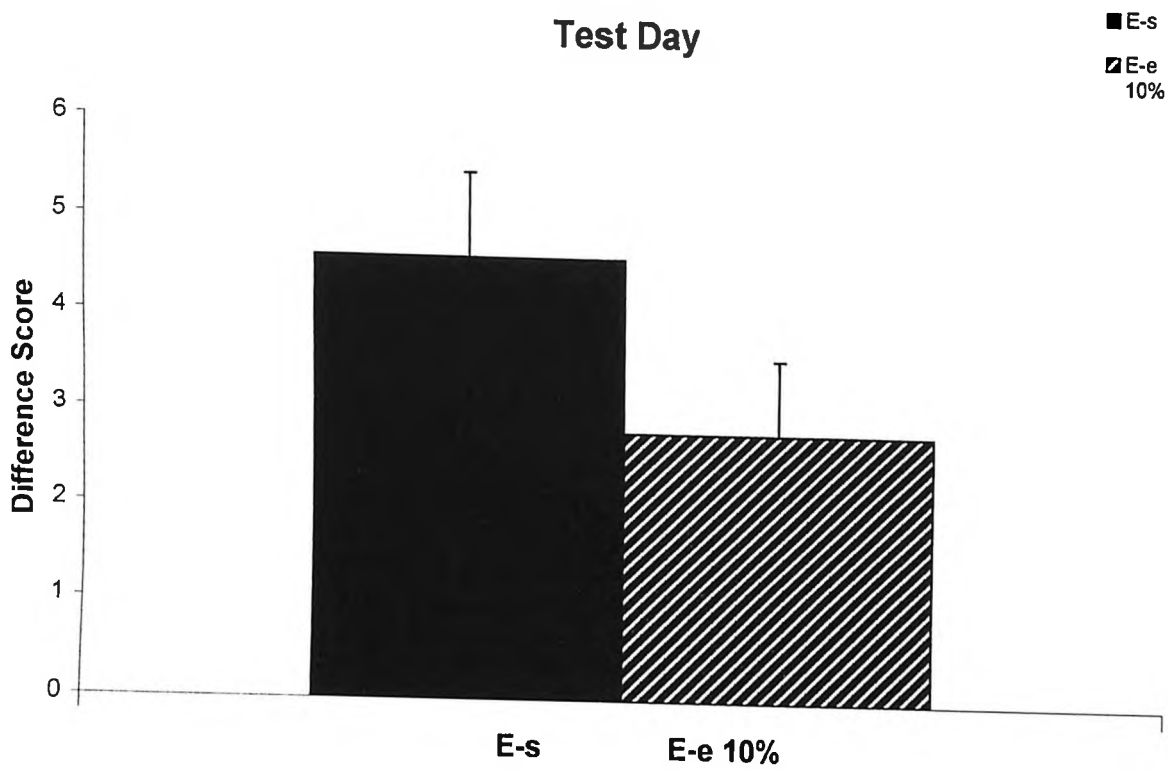

Mean Post Score Minus Mean Pre Score
E-e10%
E-s
Difference Score
8
6
4
2
0
-2
-4
-6
-8
-10
Day 18
Day 19
Day 20
Test Day

Figure 21



APPENDIX A

Raw data collected for experiment 1A presented in Chapter 2

Chapter 2, Experiment 1A
Temperatures (Celsius), Baseline Day 4

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 13	E-e	38.30	38.35	38.20	37.94	37.75	37.48	37.44	37.39	37.31
rat 7	E-e	38.14	38.13	38.16	38.09	38.00	37.94	37.89	37.91	38.01
rat 10	E-e	38.51	38.29	38.23	38.26	38.29	38.15	38.02	37.88	37.97
rat 1	S-e	39.00	38.92	38.70	38.62	38.41	38.21	37.82	37.71	37.62
rat 2	S-e	38.53	38.55	38.45	38.30	37.89	37.67	37.53	37.49	37.29
rat 3	S-e	38.35	38.28	38.20	38.03	37.81	37.78	37.64	37.41	37.29
rat 9	S-e	38.23	38.06	37.95	37.67	37.77	37.49	37.52	37.19	36.72
rat 6	S-e	38.12	38.00	37.90	37.75	37.79	37.77	37.57	37.74	37.81
rat 8	S-e	36.92	36.88	36.77	36.65	36.60	36.45	36.38	36.33	36.22
rat 4	S-s	38.61	38.49	38.29	38.19	38.19	38.20	37.89	37.86	37.92
rat 9	S-s	38.44	38.35	38.34	38.34	38.25	38.17	37.93	37.85	37.66
rat 12	S-s	37.59	37.35	37.13	37.12	37.16	37.13	37.07	37.01	36.96

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 13	E-e	37.29	37.28	37.37	37.61	37.31	37.38	37.34	37.34	37.31
rat 7	E-e	37.85	37.85	37.58	37.65	37.53	37.61	37.65	37.47	37.22
rat 10	E-e	37.82	37.78	37.69	37.70	37.69	37.57	37.47	37.42	37.40
rat 1	S-e	37.60	37.59	37.57	37.50	37.37	37.26	37.18	37.23	37.24
rat 2	S-e	37.20	37.27	37.26	37.21	37.26	37.30	37.38	37.31	37.31
rat 3	S-e	37.16	37.16	37.12	37.06	36.97	36.97	37.04	36.96	36.94
rat 9	S-e	37.11	37.31	37.08	37.23	37.23	37.39	37.40	37.34	37.31
rat 6	S-e	37.67	37.78	37.72	37.60	37.52	37.42	37.38	37.34	37.23
rat 8	S-e	36.13	36.13	36.21	36.20	36.19	36.25	36.28	36.34	36.32
rat 4	S-s	37.87	38.01	37.85	37.73	37.64	37.60	37.48	37.40	37.42
rat 9	S-s	37.36	37.22	37.17	37.13	37.08	37.03	37.01	37.10	37.10
rat 12	S-s	36.86	36.81	36.75	36.68	36.65	36.61	36.73	36.77	36.75

Chapter 2, Experiment 1A
Temperatures (Celsius), Training Phase Day 1

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 13	E-e	36.74	36.27	36.10	35.98	35.81	35.80	35.65	35.38	35.37
rat 7	E-e	36.12	35.62	35.39	35.13	35.20	35.34	35.07	34.81	34.77
rat 10	E-e	36.18	36.32	36.29	36.16	36.16	36.22	36.27	36.28	36.28
rat 1	S-e	38.77	38.62	38.16	38.42	38.34	38.03	38.07	37.89	37.68
rat 2	S-e	38.56	38.45	38.28	38.19	37.90	37.77	37.59	37.56	37.51
rat 3	S-e	38.68	38.61	38.49	38.41	38.30	38.08	37.86	37.92	37.94
rat 9	S-e	38.51	38.80	38.62	38.19	38.10	37.92	37.80	37.70	37.59
rat 6	S-e	37.97	37.81	37.91	37.85	37.61	37.70	37.63	37.50	37.65
rat 8	S-e	36.71	36.71	36.64	36.49	36.54	36.37	36.38	36.26	36.06
rat 4	S-s	38.68	38.65	38.45	38.14	38.01	37.81	37.72	37.68	37.56
rat 9	S-s	38.14	37.91	37.64	37.56	37.51	37.42	37.31	37.25	37.25
rat 12	S-s	37.37	37.31	37.36	37.36	37.24	37.10	37.03	36.98	36.90

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 13	E-e	35.48	35.44	35.44	35.63	35.72	35.74	35.68	35.67	35.68
rat 7	E-e	34.98	35.31	35.62	35.83	35.57	35.58	35.58	35.43	35.41
rat 10	E-e	36.36	36.31	36.32	36.51	36.44	36.38	36.37	36.39	36.31
rat 1	S-e	37.59	37.47	37.42	37.25	37.20	37.23	37.21	37.11	37.10
rat 2	S-e	37.46	37.38	37.34	37.31	37.30	37.33	37.30	37.12	37.08
rat 3	S-e	37.95	37.71	37.68	37.50	37.45	37.35	37.37	37.29	37.18
rat 9	S-e	37.53	37.49	37.36	37.32	37.27	37.33	37.43	37.57	37.54
rat 6	S-e	37.70	37.50	37.37	37.32	37.26	37.18	37.19	37.15	37.18
rat 8	S-e	36.06	36.05	35.99	35.95	35.98	36.01	36.01	36.06	36.01
rat 4	S-s	37.38	37.32	37.23	37.21	37.26	37.24	37.24	37.28	37.34
rat 9	S-s	37.06	36.92	36.85	36.87	36.92	36.91	36.89	36.86	36.82
rat 12	S-s	36.89	36.82	36.78	36.70	36.60	36.52	36.51	36.58	36.52

Chapter 2, Experiment 1A
Temperatures (Celsius), Training Phase Day 10

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 13	E-e	38.21	37.92	37.71	37.50	37.19	36.73	37.00	36.97	37.08
rat 7	E-e	38.81	38.37	38.15	38.02	37.90	37.89	37.63	37.61	37.43
rat 10	E-e	37.95	37.70	37.77	37.92	37.71	37.27	37.55	37.29	37.15
rat 1	S-e	39.20	38.97	38.73	38.56	38.66	38.53	38.54	38.39	38.45
rat 2	S-e	38.83	38.50	38.21	38.01	37.84	37.75	37.96	37.52	37.56
rat 3	S-e	38.63	38.51	38.47	38.19	38.12	38.35	38.33	37.92	38.13
rat 9	S-e	37.97	38.01	38.12	37.73	37.52	37.30	37.11	37.12	37.21
rat 6	S-e	38.19	38.34	38.30	38.20	38.08	37.94	37.89	37.85	37.70
rat 8	S-e	36.89	36.85	36.74	36.55	36.35	36.33	36.30	36.25	36.23
rat 4	S-s	39.16	38.93	38.64	38.32	38.10	37.88	37.64	37.55	37.69
rat 9	S-s	38.15	38.07	37.99	37.78	38.00	37.95	37.79	37.80	37.93
rat 12	S-s	37.31	37.26	37.09	36.94	36.87	36.85	36.80	36.73	36.70

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 13	E-e	37.06	37.07	37.18	37.15	37.22	37.02	36.90	36.95	37.15
rat 7	E-e	37.41	37.40	37.28	37.19	37.28	37.27	37.40	37.29	37.28
rat 10	E-e	37.11	37.03	37.00	36.97	36.99	36.59	36.43	36.58	36.62
rat 1	S-e	38.44	38.15	37.84	37.72	37.66	37.58	37.59	37.39	37.38
rat 2	S-e	37.42	36.59	36.92	36.43	36.58	36.58	36.85	36.87	36.82
rat 3	S-e	38.30	38.09	38.00	38.04	37.98	37.86	37.68	37.41	37.45
rat 9	S-e	37.13	37.13	37.11	37.33	37.57	37.41	37.41	37.37	37.30
rat 6	S-e	37.76	37.85	37.75	37.70	37.67	37.72	37.67	37.76	37.82
rat 8	S-e	36.24	36.32	36.43	36.50	36.46	36.32	36.10	35.97	35.95
rat 4	S-s	37.85	37.58	37.68	37.54	37.52	37.61	37.65	37.65	37.62
rat 9	S-s	37.90	37.55	37.41	37.19	37.12	37.11	37.14	37.09	37.02
rat 12	S-s	36.72	36.67	36.67	36.65	36.49	36.58	36.60	36.65	36.64

Chapter 2, Experiment 1A
Temperatures (Celsius), Test Phase I

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 13	E-e	38.56	38.19	38.07	37.80	38.02	37.80	37.75	37.74	37.57
rat 7	E-e	37.95	37.68	37.59	37.53	37.48	37.42	37.42	37.41	37.37
rat 10	E-e	38.22	37.90	37.76	37.89	37.83	37.08	37.15	37.26	37.08
rat 1	S-e	38.72	38.70	38.76	38.72	38.70	38.65	38.65	38.64	38.54
rat 2	S-e	39.09	39.02	39.00	38.99	38.96	38.92	38.90	38.85	38.81
rat 3	S-e	38.56	38.19	38.07	37.80	38.02	37.80	37.75	37.74	37.57
rat 9	S-e	37.98	37.87	37.74	38.06	37.80	37.94	38.18	38.26	37.97
rat 6	S-e	38.33	38.13	37.94	37.99	37.95	37.57	37.37	37.35	37.35
rat 8	S-e	36.20	35.86	35.55	35.27	35.21	35.09	35.31	34.94	35.09
rat 4	S-s	38.56	38.39	38.13	37.97	37.67	37.54	37.45	37.38	37.36
rat 9	S-s	38.69	38.49	38.39	38.11	38.09	38.12	38.10	37.95	37.97
rat 12	S-s	37.30	37.23	37.42	37.31	37.17	37.15	36.96	37.14	37.24

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 13	E-e	37.65	37.63	37.36	37.24	37.21	37.17	37.34	37.31	37.30
rat 7	E-e	37.36	37.29	37.28	37.27	37.26	37.13	37.07	37.06	37.08
rat 10	E-e	37.06	36.98	36.94	36.98	36.90	36.78	36.89	36.91	36.85
rat 1	S-e	38.42	38.35	38.31	38.24	38.21	38.19	38.11	38.08	37.99
rat 2	S-e	38.81	38.75	38.70	38.71	38.65	38.54	38.51	38.49	38.41
rat 3	S-e	37.65	37.63	37.36	37.24	37.21	37.17	37.34	37.31	37.28
rat 9	S-e	37.62	37.45	37.42	37.23	37.03	36.98	36.99	36.84	36.81
rat 6	S-e	37.34	37.34	37.34	37.39	37.44	37.47	37.51	37.60	37.54
rat 8	S-e	35.31	35.59	35.89	35.06	35.10	35.24	35.42	35.39	35.41
rat 4	S-s	37.31	37.12	37.13	37.28	37.39	37.43	37.49	37.56	37.52
rat 9	S-s	38.05	37.84	37.98	37.63	37.35	37.29	37.28	37.27	37.21
rat 12	S-s	37.23	37.21	37.15	37.07	36.97	36.67	36.59	36.69	36.62

Chapter 2, Experiment 1A
Temperatures (Celsius), Test Phase II

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 13	E-e	38.46	38.59	38.50	38.26	38.09	37.99	38.05	37.93	37.96
rat 7	E-e	38.41	38.31	38.28	38.32	38.20	38.11	38.03	37.98	37.91
rat 10	E-e	38.66	38.52	38.52	38.14	37.72	37.72	37.45	37.34	37.40
rat 1	S-e	38.82	38.42	38.05	38.27	37.89	37.88	37.56	37.59	37.73
rat 2	S-e	38.48	38.46	38.38	38.09	37.82	37.55	37.49	37.40	37.09
rat 3	S-e	38.80	38.31	37.97	37.94	37.91	37.63	37.64	37.83	37.69
rat 9	S-e	38.02	37.98	38.13	37.56	37.21	37.15	37.04	37.03	37.04
rat 6	S-e	39.17	38.92	38.84	38.61	38.63	38.17	38.25	38.10	38.13
rat 8	S-e	36.93	36.91	36.59	36.45	36.38	36.37	36.32	36.23	36.14
rat 4	S-s	38.80	38.42	38.07	37.88	37.88	37.88	37.69	37.41	37.33
rat 9	S-s	38.30	38.11	38.11	37.81	37.48	37.29	37.19	37.14	37.15
rat 12	S-s	37.40	37.27	37.53	37.60	37.49	37.45	37.23	37.24	36.92

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 13	E-e	37.91	37.61	37.60	37.59	37.55	37.55	37.45	37.38	37.35
rat 7	E-e	37.62	37.62	37.74	37.75	37.65	37.46	37.44	37.47	37.50
rat 10	E-e	37.34	37.31	37.44	37.71	37.71	37.71	37.27	37.48	37.50
rat 1	S-e	37.45	37.52	37.41	37.02	36.75	36.62	36.49	37.05	37.01
rat 2	S-e	36.88	36.85	36.80	36.81	36.77	36.87	37.04	37.21	37.18
rat 3	S-e	37.60	37.59	37.49	37.29	37.12	36.99	36.93	37.02	37.01
rat 9	S-e	37.13	37.14	37.10	37.10	36.95	36.96	37.03	37.03	37.01
rat 6	S-e	38.15	38.14	38.19	38.26	38.25	38.22	38.18	38.10	37.97
rat 8	S-e	36.13	36.13	36.13	36.12	36.23	36.14	36.09	36.15	36.16
rat 4	S-s	37.29	37.35	37.23	37.18	37.25	37.28	37.24	37.24	37.16
rat 9	S-s	37.08	36.91	36.85	36.76	36.70	36.84	36.87	36.82	36.81
rat 12	S-s	36.78	36.83	36.82	36.82	36.83	36.85	36.93	36.91	37.00

APPENDIX B

Raw data collected for experiment 1B presented in Chapter 2

Chapter 2, Experiment 1B
Temperatures (Celsius), Baseline Day 4

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 2	E-e 10%	38.38	38.64	38.49	38.52	38.39	38.37	38.24	38.24	38.20
rat 3	E-e 10%	38.75	38.75	38.76	38.77	38.54	38.67	38.68	38.74	38.54
rat 14	E-e 10%	37.76	37.74	37.61	37.52	37.40	37.35	37.34	37.19	37.12
rat 22	E-e 10%	38.45	38.38	38.03	37.63	37.59	37.55	37.59	37.64	37.53
rat 24	E-e 10%	38.44	38.19	38.01	37.83	37.80	37.76	37.67	37.56	37.43
rat 4	E-e 20%	38.30	38.57	38.63	38.66	38.30	38.14	38.28	38.31	38.21
rat 5	E-e 20%	37.41	37.77	37.80	37.71	37.68	37.77	37.72	37.77	37.84
rat 6	E-e 20%	38.04	38.08	37.73	37.42	37.15	37.26	37.59	37.54	37.54
rat 10	E-e 20%	38.59	38.61	38.35	38.29	38.24	37.96	37.79	37.96	38.04
rat 16	E-e 20%	37.34	37.53	37.68	37.46	37.56	37.62	37.46	37.82	37.60
rat 1	S-s	38.58	38.61	38.51	38.42	38.44	38.48	38.40	38.41	38.34
rat 12	S-s	38.98	38.87	38.67	38.48	38.28	38.19	38.04	37.86	37.73
rat 15	S-s	38.22	38.28	38.21	38.13	37.83	38.00	38.09	38.00	37.68
rat 17	S-s	38.37	38.27	38.14	37.87	37.84	37.62	37.48	37.45	37.47
rat 19	S-s	38.32	38.37	38.14	37.77	37.57	37.46	37.28	37.29	37.17
rat 20	S-s	38.71	38.63	38.37	38.46	38.30	38.34	38.26	38.12	38.13
rat 26	S-s	37.95	37.87	37.80	37.74	37.50	37.35	37.19	37.17	37.21
rat 7	E-s	38.34	38.47	38.41	38.40	38.35	38.31	38.25	38.12	38.01
rat 11	E-s	38.81	38.90	38.92	38.92	38.93	38.78	38.65	38.40	38.22
rat 13	E-s	39.02	38.78	38.66	38.48	38.32	38.14	37.97	37.73	37.68
rat 21	E-s	38.21	38.11	38.00	37.98	37.88	37.83	37.88	37.90	37.81
rat 25	E-s	38.48	38.31	38.19	38.10	37.88	37.63	37.50	37.46	37.44

Chapter 2, Experiment 1B
Temperatures (Celsius), Baseline Day 4 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 2	E-e 10%	38.06	38.04	37.86	37.79	37.70	37.62	37.53	37.47	37.42
rat 3	E-e 10%	38.62	38.45	38.60	38.57	38.49	38.40	38.17	38.09	37.74
rat 14	E-e 10%	37.10	37.28	37.25	37.18	37.14	37.11	37.07	37.02	37.00
rat 22	E-e 10%	37.42	37.39	37.38	37.37	37.33	37.32	37.40	37.45	37.46
rat 24	E-e 10%	37.36	37.28	37.21	37.17	37.11	37.11	37.17	37.13	37.12
rat 4	E-e 20%	38.12	38.04	37.77	37.89	37.90	37.85	37.34	37.38	37.47
rat 5	E-e 20%	37.81	37.62	37.42	37.58	37.64	37.45	37.48	37.51	37.33
rat 6	E-e 20%	37.58	37.71	37.73	37.74	37.69	37.71	37.70	37.70	37.69
rat 10	E-e 20%	37.90	37.83	37.47	37.40	37.31	37.26	37.18	37.02	36.98
rat 16	E-e 20%	37.53	37.52	37.37	37.07	36.89	37.04	37.12	37.03	37.03
rat 1	S-s	38.25	38.05	38.06	38.03	38.19	38.24	38.20	37.97	37.94
rat 12	S-s	37.60	37.48	37.41	37.31	37.24	37.20	37.26	37.29	37.28
rat 15	S-s	37.71	37.72	37.58	37.44	37.34	37.41	37.37	37.35	37.33
rat 17	S-s	37.45	37.57	37.64	37.76	37.83	37.73	37.55	37.43	37.69
rat 19	S-s	37.10	37.07	37.04	37.03	37.08	37.15	37.14	37.10	36.98
rat 20	S-s	38.35	38.41	38.05	37.74	37.59	37.47	37.35	37.23	37.11
rat 26	S-s	37.18	37.13	37.14	37.17	37.17	37.18	37.17	37.19	37.12
rat 7	E-s	37.98	37.93	37.90	37.85	37.76	37.66	37.38	37.33	37.32
rat 11	E-s	38.20	38.47	38.61	38.49	38.47	38.29	38.07	37.98	38.08
rat 13	E-s	37.60	37.51	37.45	37.38	37.33	37.31	37.30	37.25	37.23
rat 21	E-s	37.74	37.64	37.58	37.55	37.49	37.47	37.33	37.31	37.28
rat 25	E-s	37.47	37.74	37.33	37.18	37.19	37.19	37.18	37.18	37.15

Chapter 2, Experiment 1B
Temperatures (Celsius), Training Phase Day 1

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 2	E-e 10%	36.78	36.66	36.84	36.67	36.73	36.74	36.78	36.67	36.66
rat 3	E-e 10%	37.18	36.64	36.45	36.33	36.13	36.19	36.07	35.92	35.92
rat 14	E-e 10%	37.85	37.35	37.01	37.06	37.10	36.93	36.67	36.71	36.78
rat 22	E-e 10%	37.35	36.95	36.80	36.83	36.88	36.79	36.45	36.28	36.15
rat 24	E-e 10%	37.83	37.67	37.53	37.45	37.26	37.26	37.25	37.25	37.26
rat 4	E-e 20%	36.49	36.42	36.43	36.15	35.99	35.85	35.95	36.01	35.69
rat 5	E-e 20%	37.29	36.81	36.38	36.34	36.47	36.33	36.31	36.32	36.36
rat 6	E-e 20%	37.61	37.52	37.35	37.21	36.93	36.65	36.57	36.45	36.46
rat 10	E-e 20%	38.05	37.45	36.95	36.64	36.77	36.57	36.57	36.71	36.74
rat 16	E-e 20%	36.89	36.31	36.02	36.12	35.89	35.78	35.90	35.70	35.77
rat 1	S-s	38.91	38.84	38.66	38.56	38.49	38.40	38.30	38.23	38.04
rat 12	S-s	39.39	39.20	38.99	38.94	38.70	38.47	38.24	38.05	37.88
rat 15	S-s	38.50	38.38	38.25	38.15	37.84	37.83	38.10	38.08	38.05
rat 17	S-s	39.16	38.73	38.28	38.10	38.01	38.03	37.87	37.65	37.62
rat 19	S-s	38.13	37.97	37.81	37.87	37.89	37.86	37.72	37.74	37.77
rat 20	S-s	39.02	38.84	38.63	38.65	38.39	38.31	38.27	38.13	38.12
rat 26	S-s	38.11	38.16	38.22	38.32	38.25	37.92	37.73	37.56	37.41
rat 7	E-s	37.22	36.63	36.31	36.10	36.09	36.21	36.29	36.14	36.04
rat 11	E-s	38.42	37.83	37.72	37.61	36.95	37.20	37.25	37.51	37.40
rat 13	E-s	38.63	38.06	37.79	37.48	37.28	37.11	36.97	36.97	37.00
rat 21	E-s	37.28	37.10	37.03	36.99	36.98	36.91	36.83	36.87	36.76
rat 25	E-s	36.32	35.93	35.73	35.64	35.73	35.80	36.08	36.27	36.34

Chapter 2, Experiment 1B
Temperatures (Celsius), Training Phase Day 1 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 2	E-e 10%	36.70	36.73	36.83	36.93	36.94	36.90	36.88	36.84	36.81
rat 3	E-e 10%	36.08	36.30	36.51	36.69	36.79	36.53	36.28	36.14	36.04
rat 14	E-e 10%	36.53	36.42	36.32	36.53	36.70	36.79	36.83	36.84	36.67
rat 22	E-e 10%	36.10	36.10	36.14	36.20	36.15	36.03	35.82	35.69	35.66
rat 24	E-e 10%	37.24	37.23	37.20	37.14	37.08	37.00	37.04	37.08	36.98
rat 4	E-e 20%	35.64	35.82	35.97	36.02	35.88	35.84	35.98	36.04	36.08
rat 5	E-e 20%	36.35	36.15	35.76	35.94	36.03	36.08	36.19	36.32	36.35
rat 6	E-e 20%	36.44	36.46	36.49	36.47	36.40	36.36	36.36	36.37	36.23
rat 10	E-e 20%	36.62	36.58	36.65	36.68	36.71	36.75	36.75	36.49	36.59
rat 16	E-e 20%	35.78	35.56	35.57	35.66	35.78	35.82	35.85	35.57	35.81
rat 1	S-s	37.85	37.90	37.91	37.87	37.85	37.78	37.75	37.73	37.64
rat 12	S-s	37.78	37.72	37.75	37.74	37.72	37.68	37.70	37.70	37.70
rat 15	S-s	37.87	37.67	37.47	37.51	37.35	37.21	37.16	37.12	36.96
rat 17	S-s	37.59	37.57	37.51	37.46	37.50	37.49	37.51	37.44	37.41
rat 19	S-s	37.54	37.29	37.24	37.21	37.19	37.21	36.95	36.94	36.85
rat 20	S-s	38.08	37.75	37.64	37.47	37.27	37.17	37.12	37.08	37.07
rat 26	S-s	37.35	37.38	37.35	37.30	37.25	37.27	37.24	37.24	37.24
rat 7	E-s	36.09	36.22	36.37	36.23	35.93	35.86	35.93	36.05	36.06
rat 11	E-s	37.61	37.47	37.42	37.34	37.39	37.11	37.04	37.21	37.44
rat 13	E-s	36.93	36.91	36.88	36.87	36.91	36.98	36.94	36.86	36.73
rat 21	E-s	36.69	36.78	37.04	37.06	36.81	36.71	36.72	36.70	36.76
rat 25	E-s	36.41	36.47	36.52	36.54	36.24	36.13	36.08	36.28	36.46

Chapter 2, Experiment 1B
Temperatures (Celsius), Training Phase Day 12

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 2	E-e 10%	38.36	38.09	38.00	37.86	37.56	37.23	37.06	36.97	36.86
rat 3	E-e 10%	38.27	37.66	37.42	37.10	37.01	36.84	36.92	36.84	36.75
rat 14	E-e 10%	38.29	38.26	38.12	37.84	37.66	37.49	37.27	37.36	37.47
rat 22	E-e 10%	37.76	37.58	37.34	37.10	37.30	37.33	36.96	37.03	37.15
rat 24	E-e 10%	37.99	38.01	38.09	37.84	37.52	37.17	37.12	37.20	37.11
rat 4	E-e 20%	37.56	37.09	36.91	37.16	36.96	37.10	37.07	37.30	37.56
rat 5	E-e 20%	37.81	37.44	37.31	37.40	37.36	37.42	37.43	37.38	37.29
rat 6	E-e 20%	37.85	37.46	37.11	36.87	37.03	37.09	36.95	36.77	36.71
rat 10	E-e 20%	36.89	36.52	36.37	36.40	36.26	36.25	36.37	36.03	36.08
rat 16	E-e 20%	36.39	35.77	35.58	35.44	35.45	35.61	35.28	35.67	35.90
rat 1	S-s	38.45	38.43	38.40	38.18	38.16	37.93	37.89	37.64	37.50
rat 12	S-s	38.84	38.75	38.73	38.53	38.21	38.12	37.95	37.79	37.64
rat 15	S-s	38.70	38.69	38.56	38.35	37.96	37.74	37.69	37.63	37.49
rat 17	S-s	38.83	38.72	38.49	38.11	37.84	37.80	37.71	37.58	37.42
rat 19	S-s	38.05	38.11	38.06	37.83	37.54	37.39	37.24	37.13	37.00
rat 20	S-s	38.50	38.63	38.20	37.93	37.87	37.84	38.00	38.08	38.14
rat 26	S-s	38.70	38.62	38.48	38.36	38.40	38.00	37.72	37.58	37.47
rat 7	E-s	38.48	38.07	37.71	37.70	37.32	37.58	37.60	37.49	37.29
rat 11	E-s	38.82	38.41	38.08	37.69	37.63	37.65	37.51	37.41	37.35
rat 13	E-s	38.49	38.15	37.93	37.76	37.43	37.50	37.63	37.55	37.41
rat 21	E-s	37.69	37.16	36.92	37.05	37.03	37.05	37.10	37.08	37.02
rat 25	E-s	37.55	37.35	37.21	37.28	37.31	37.47	37.52	37.49	37.27

Chapter 2, Experiment 1B
Temperatures (Celsius), Training Phase Day 12 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 2	E-e 10%	36.88	36.89	36.91	36.93	36.96	36.94	36.93	36.97	37.01
rat 3	E-e 10%	36.66	36.65	36.72	36.83	37.06	37.14	36.90	36.66	36.65
rat 14	E-e 10%	37.52	37.41	37.32	37.29	37.24	37.28	37.04	36.76	36.89
rat 22	E-e 10%	37.22	36.72	36.68	36.82	37.02	36.79	36.44	36.67	36.81
rat 24	E-e 10%	37.13	36.90	36.90	37.01	36.84	36.58	36.79	36.89	36.97
rat 4	E-e 20%	37.17	36.90	36.86	36.92	37.16	37.07	37.04	37.00	36.94
rat 5	E-e 20%	37.20	37.14	37.12	37.05	37.02	37.05	37.05	37.03	37.00
rat 6	E-e 20%	36.76	36.75	36.81	36.78	36.78	36.43	36.46	36.65	36.80
rat 10	E-e 20%	36.25	36.03	35.90	36.11	36.25	36.41	36.48	36.54	36.59
rat 16	E-e 20%	35.97	35.89	36.00	35.82	35.98	36.24	36.36	36.37	36.37
rat 1	S-s	37.39	37.33	37.55	37.85	37.63	37.76	37.74	37.33	37.42
rat 12	S-s	37.49	37.40	37.37	37.35	37.31	37.22	37.11	37.09	37.12
rat 15	S-s	37.23	37.00	36.82	36.79	36.85	36.95	37.00	36.93	37.00
rat 17	S-s	37.45	37.68	37.62	37.40	37.39	37.30	37.21	37.30	37.63
rat 19	S-s	36.94	37.00	36.99	37.02	36.89	36.87	36.85	36.81	36.95
rat 20	S-s	38.15	38.02	37.86	37.70	37.52	37.37	37.04	36.92	37.18
rat 26	S-s	37.48	37.48	37.55	37.41	37.63	37.68	37.48	37.36	37.43
rat 7	E-s	37.06	36.78	37.10	37.20	37.25	37.27	37.31	37.37	37.39
rat 11	E-s	37.33	37.32	37.24	37.20	37.19	37.18	37.14	37.13	37.02
rat 13	E-s	37.30	37.25	37.22	37.18	37.20	37.14	37.13	37.18	37.21
rat 21	E-s	36.95	36.86	36.89	36.95	37.03	37.08	37.09	37.06	37.13
rat 25	E-s	37.38	37.37	37.47	37.43	37.39	37.29	37.01	36.91	36.94

Chapter 2, Experiment 1B
Temperatures (Celsius), Test Phase

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 2	E-e 10%	38.65	38.82	38.85	38.85	38.66	38.54	38.67	38.63	38.36
rat 3	E-e 10%	38.76	38.73	38.55	38.59	38.64	38.32	38.30	38.52	38.49
rat 14	E-e 10%	38.02	38.00	37.92	37.82	37.60	37.67	37.59	37.57	37.55
rat 22	E-e 10%	38.48	38.35	38.28	38.19	38.04	37.83	37.97	37.78	37.62
rat 24	E-e 10%	38.40	38.41	38.38	38.31	37.94	37.68	37.57	37.45	37.42
rat 4	E-e 20%	39.45	39.16	39.01	38.85	38.81	38.71	38.62	38.68	38.59
rat 5	E-e 20%	38.68	38.64	38.40	38.35	38.32	38.16	38.13	38.30	38.31
rat 6	E-e 20%	38.27	38.39	38.40	38.26	38.22	38.12	37.95	38.09	38.16
rat 10	E-e 20%	38.26	38.38	38.27	38.10	38.13	38.10	38.05	37.85	37.71
rat 16	E-e 20%	37.32	37.71	37.80	37.71	37.44	37.58	37.59	37.60	37.64
rat 1	S-s	38.85	39.08	38.88	38.74	38.67	38.34	38.23	38.31	38.24
rat 12	S-s	38.67	38.74	38.56	38.38	38.07	37.88	37.74	37.63	37.60
rat 15	S-s	38.16	38.31	38.22	38.31	38.16	37.97	37.75	37.55	37.43
rat 17	S-s	38.42	38.47	38.14	37.89	37.70	37.77	37.83	37.81	37.76
rat 19	S-s	38.30	38.35	38.32	38.20	38.16	38.11	37.91	37.81	37.82
rat 20	S-s	38.45	38.34	38.20	37.79	37.53	37.38	37.41	37.18	37.21
rat 26	S-s	37.71	38.06	38.20	38.42	38.35	37.93	37.46	37.35	37.35
rat 7	E-s	38.32	38.55	38.57	38.49	38.32	38.12	38.15	38.05	37.88
rat 11	E-s	39.28	39.20	38.92	38.86	38.66	38.56	38.52	38.38	38.11
rat 13	E-s	38.61	38.71	38.58	38.43	38.35	38.34	38.44	38.34	38.18
rat 21	E-s	38.02	38.15	38.31	38.36	38.38	38.42	38.41	38.26	38.20
rat 25	E-s	38.03	38.21	38.22	37.90	37.90	37.73	37.76	37.65	37.54

Chapter 2, Experiment 1B
Temperatures (Celsius), Test Phase (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 2	E-e 10%	38.09	38.19	38.31	38.07	37.98	37.83	37.83	37.73	37.61
rat 3	E-e 10%	38.35	38.21	38.16	38.09	38.03	38.03	37.85	37.65	37.50
rat 14	E-e 10%	37.54	37.52	37.38	37.36	37.38	37.32	37.21	37.18	37.17
rat 22	E-e 10%	37.56	37.53	37.51	37.49	37.60	37.64	37.58	37.43	37.27
rat 24	E-e 10%	37.42	37.37	37.30	37.35	37.37	37.39	37.43	37.55	37.46
rat 4	E-e 20%	38.63	38.44	38.27	38.39	38.40	38.30	38.18	38.25	37.97
rat 5	E-e 20%	38.25	38.16	37.90	37.72	37.67	37.62	37.59	37.55	37.42
rat 6	E-e 20%	37.95	37.89	37.86	37.81	37.73	37.78	37.82	37.81	37.83
rat 10	E-e 20%	37.66	37.57	37.46	37.38	37.30	37.37	37.34	37.50	37.59
rat 16	E-e 20%	37.51	37.55	37.40	37.31	37.16	36.89	37.01	37.06	36.98
rat 1	S-s	38.10	37.96	38.13	38.12	37.84	37.70	37.64	37.55	37.40
rat 12	S-s	37.58	37.54	37.48	37.42	37.39	37.27	37.22	37.22	37.26
rat 15	S-s	37.36	37.20	37.04	36.86	36.83	36.79	36.95	37.02	36.99
rat 17	S-s	37.66	37.59	37.67	37.95	38.00	37.66	37.40	37.25	37.33
rat 19	S-s	37.67	37.36	37.19	37.11	37.00	36.88	36.88	36.88	36.81
rat 20	S-s	37.29	37.33	37.30	37.27	37.23	37.21	37.17	37.29	37.73
rat 26	S-s	37.25	37.23	37.45	37.31	37.05	36.99	37.04	37.13	37.20
rat 7	E-s	37.83	37.83	37.85	37.77	37.66	37.57	37.46	37.42	37.43
rat 11	E-s	38.02	37.83	37.71	37.60	37.47	37.16	37.02	36.96	36.95
rat 13	E-s	38.18	38.13	38.04	37.92	37.89	37.84	37.73	37.64	37.57
rat 21	E-s	38.16	38.16	38.17	38.07	38.05	38.10	38.06	37.95	37.86
rat 25	E-s	37.47	37.43	37.41	37.43	37.42	37.39	37.39	37.29	37.19

APPENDIX C

Raw data collected for experiment 1C presented in Chapter 2

Chapter 2, Experiment 1C
Temperatures (Celsius), Baseline Day 4

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	E-e 10%	38.70	38.42	38.42	38.36	38.18	38.26	38.48	38.49	38.30
rat 4	E-e 10%	38.32	38.06	38.02	37.92	37.53	37.44	37.39	37.36	37.12
rat 6	E-e 10%	38.55	38.61	38.56	38.61	38.41	38.21	38.39	38.57	38.44
rat 32	E-e 10%	38.75	38.56	38.42	38.29	38.11	38.00	37.98	37.84	37.76
rat 33	E-e 10%	38.29	38.04	37.89	37.70	37.73	37.62	37.53	37.43	37.34
rat 22	E-e 20%	38.66	38.58	38.43	38.35	38.22	38.18	37.98	37.80	37.71
rat 21	E-e 20%	39.04	38.85	38.70	38.57	38.40	38.16	38.01	37.87	37.84
rat 28	E-e 20%	38.28	38.26	38.01	37.69	37.53	37.53	37.40	37.41	37.39
rat 29	E-e 20%	38.57	38.72	38.85	38.78	38.37	38.12	37.97	37.89	37.87
rat 5	S-s	39.36	39.13	39.07	39.01	39.12	38.95	38.84	38.64	38.53
rat 12	S-s	38.57	38.38	38.22	38.11	37.86	37.76	37.26	37.36	37.34
rat 13	S-s	38.49	38.32	38.31	38.06	37.72	37.35	37.27	37.24	37.13
rat 17	S-s	38.28	38.21	38.19	38.05	37.74	37.54	37.45	37.38	37.39
rat 20	S-s	39.25	39.43	39.46	39.43	39.16	39.00	38.56	38.48	38.45
rat 2	E-s	38.22	38.12	38.03	37.74	37.68	37.86	37.90	37.88	37.82
rat 27	E-s	38.01	37.81	37.75	37.64	37.45	37.31	37.23	37.26	37.25
rat 24	E-s	38.45	38.27	38.07	38.07	38.03	37.96	37.90	37.79	37.72
rat 31	E-s	38.70	38.56	38.48	38.19	38.07	37.93	37.81	37.73	37.62

Chapter 2, Experiment 1C
Temperatures (Celsius), Baseline Day 4 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	E-e 10%	38.19	38.13	38.09	38.05	38.03	38.00	37.96	37.94	37.93
rat 4	E-e 10%	37.09	37.06	36.99	37.02	37.07	36.95	36.77	36.71	36.79
rat 6	E-e 10%	38.19	38.10	37.93	37.78	37.72	37.73	37.67	37.57	37.53
rat 32	E-e 10%	37.50	37.30	37.20	37.11	37.03	36.99	36.96	36.90	36.86
rat 33	E-e 10%	37.25	37.14	36.99	36.95	36.95	36.98	36.94	36.76	36.77
rat 22	E-e 20%	37.65	37.60	37.57	37.51	37.48	37.49	37.50	37.54	37.52
rat 21	E-e 20%	37.83	37.69	37.66	37.68	37.61	37.55	37.54	37.54	37.59
rat 28	E-e 20%	37.29	37.28	37.23	37.24	37.20	37.18	37.19	37.20	37.19
rat 29	E-e 20%	37.77	37.73	37.65	37.51	37.51	37.50	37.51	37.47	37.21
rat 5	S-s	38.44	38.38	38.33	38.27	38.15	38.18	38.26	38.27	38.24
rat 12	S-s	37.12	37.19	37.18	37.19	37.24	37.33	37.39	37.23	36.99
rat 13	S-s	37.11	37.17	37.27	37.23	36.99	36.94	37.04	37.03	37.00
rat 17	S-s	37.45	37.33	37.27	37.22	37.25	37.22	37.24	37.31	37.21
rat 20	S-s	38.54	38.70	38.61	38.25	38.08	37.94	37.84	37.76	37.72
rat 2	E-s	37.97	37.99	37.91	37.87	37.77	37.67	37.54	37.44	37.49
rat 27	E-s	37.31	37.31	37.37	37.39	37.35	37.31	37.23	36.98	36.92
rat 24	E-s	37.68	37.63	37.56	37.62	37.68	37.47	37.32	37.36	37.45
rat 31	E-s	37.46	37.49	37.43	37.37	37.32	37.35	37.34	37.32	37.37

Chapter 2, Experiment 1C
Temperatures (Celsius), Training Phase Day 1

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	ethanol	36.85	36.71	36.53	36.16	36.10	35.90	36.10	36.30	36.4
rat 4	ethanol	36.63	36.56	36.25	35.99	36.00	36.00	36.22	36.44	36.4
rat 6	ethanol	38.41	38.23	37.84	37.56	37.39	37.63	37.63	37.56	37.5
rat 32	ethanol	38.25	37.82	37.34	37.32	37.11	37.01	37.18	37.24	37.0
rat 33	ethanol	38.01	37.67	37.57	37.60	37.56	37.40	37.13	37.11	36.8
rat 22	ethanol	37.83	37.69	37.55	37.58	37.55	37.64	37.38	37.38	37.2
rat 21	ethanol	38.88	38.37	38.05	37.89	37.57	37.48	37.41	37.20	37.1
rat 28	ethanol	37.83	37.17	36.85	36.86	36.94	36.76	36.64	36.72	36.8
rat 29	ethanol	38.17	37.74	37.60	37.61	37.35	36.99	37.17	37.20	37.1
rat 2	ethanol	37.22	37.20	37.27	37.33	37.30	37.17	37.13	37.11	37.0
rat 27	ethanol	38.60	38.29	37.99	37.87	37.87	37.76	37.59	37.73	37.6
rat 24	ethanol	36.80	36.41	36.21	36.13	35.97	35.85	35.96	36.12	36.2
rat 31	ethanol	39.37	39.19	38.03	37.36	38.46	38.64	38.17	38.19	38.1
rat 5	saline	39.14	39.06	39.00	39.00	38.85	38.75	38.73	38.75	38.3
rat 12	saline	38.99	38.82	38.53	38.60	38.44	38.40	38.19	37.88	37.8
rat 13	saline	38.85	38.84	38.61	38.09	37.77	37.56	37.53	37.29	37.2
rat 17	saline	38.54	38.61	38.48	38.18	37.79	37.71	37.63	37.58	37.5
rat 20	saline	38.86	38.73	38.75	38.57	38.49	38.30	38.15	38.06	37.9

Chapter 2, Experiment 1C
Temperatures (Celsius), Training Phase Day 1 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	ethanol	36.59	36.54	36.30	36.11	35.99	36.07	36.15	36.23	36.3
rat 4	ethanol	36.15	35.98	35.97	36.06	36.21	36.33	36.43	36.51	36.6
rat 6	ethanol	37.49	37.47	37.41	37.34	37.25	37.39	37.35	37.33	37.3
rat 32	ethanol	36.86	36.86	36.92	36.95	36.96	36.91	36.65	36.60	36.6
rat 33	ethanol	36.90	36.74	36.64	36.73	36.60	36.60	36.69	36.84	36.9
rat 22	ethanol	37.19	37.21	37.26	37.33	37.39	37.40	37.38	37.42	37.5
rat 21	ethanol	37.19	37.22	37.24	37.06	37.03	37.07	37.13	37.16	37.2
rat 28	ethanol	37.00	37.06	37.08	37.09	36.99	36.66	36.66	36.49	36.4
rat 29	ethanol	37.14	37.22	37.09	37.02	37.20	37.15	37.34	37.29	37.2
rat 2	ethanol	36.91	36.95	36.99	36.98	37.02	37.04	37.01	36.98	36.9
rat 27	ethanol	37.47	37.26	37.32	37.37	37.36	37.36	37.32	37.29	37.2
rat 24	ethanol	36.28	36.34	36.41	36.47	36.27	36.21	36.19	36.21	36.2
rat 31	ethanol	38.28	38.19	38.25	38.39	38.56	38.50	38.13	38.02	37.9
rat 5	saline	38.38	38.40	38.40	38.37	38.33	38.32	38.29	38.26	38.2
rat 12	saline	37.73	37.57	37.47	37.45	37.41	37.52	37.37	37.24	37.2
rat 13	saline	37.30	37.11	37.12	37.31	37.42	37.20	37.14	37.04	37.1
rat 17	saline	37.67	37.50	37.44	37.45	37.32	37.25	37.33	37.26	37.2
rat 20	saline	37.87	37.78	37.78	37.89	38.21	38.12	37.96	37.93	37.8

Chapter 2, Experiment 1C
Temperatures (Celsius), Training Phase Day 1

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	E-e 10%	36.85	36.71	36.53	36.16	36.10	35.90	36.10	36.30	36.47
rat 4	E-e 10%	36.63	36.56	36.25	35.99	36.00	36.00	36.22	36.44	36.49
rat 6	E-e 10%	38.41	38.23	37.84	37.56	37.39	37.63	37.63	37.56	37.54
rat 32	E-e 10%	38.25	37.82	37.34	37.32	37.11	37.01	37.18	37.24	37.03
rat 33	E-e 10%	38.01	37.67	37.57	37.60	37.56	37.40	37.13	37.11	36.83
rat 22	E-e 20%	37.83	37.69	37.55	37.58	37.55	37.64	37.38	37.38	37.24
rat 21	E-e 20%	38.88	38.37	38.05	37.89	37.57	37.48	37.41	37.20	37.13
rat 28	E-e 20%	37.83	37.17	36.85	36.86	36.94	36.76	36.64	36.72	36.85
rat 29	E-e 20%	38.17	37.74	37.60	37.61	37.35	36.99	37.17	37.20	37.14
rat 5	S-s	39.14	39.06	39.00	39.00	38.85	38.75	38.73	38.75	38.36
rat 12	S-s	38.99	38.82	38.53	38.60	38.44	38.40	38.19	37.88	37.89
rat 13	S-s	38.85	38.84	38.61	38.09	37.77	37.56	37.53	37.29	37.23
rat 17	S-s	38.54	38.61	38.48	38.18	37.79	37.71	37.63	37.58	37.59
rat 20	S-s	38.86	38.73	38.75	38.57	38.49	38.30	38.15	38.06	37.94
rat 2	E-s	37.22	37.20	37.27	37.33	37.30	37.17	37.13	37.11	37.03
rat 27	E-s	38.60	38.29	37.99	37.87	37.87	37.76	37.59	37.73	37.69
rat 24	E-s	36.80	36.41	36.21	36.13	35.97	35.85	35.96	36.12	36.21
rat 31	E-s	39.37	39.19	38.03	37.36	38.46	38.64	38.17	38.19	38.16

Chapter 2, Experiment 1C
Temperatures (Celsius), Training Phase Day 1 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	E-e 10%	36.59	36.54	36.30	36.11	35.99	36.07	36.15	36.23	36.31
rat 4	E-e 10%	36.15	35.98	35.97	36.06	36.21	36.33	36.43	36.51	36.61
rat 6	E-e 10%	37.49	37.47	37.41	37.34	37.25	37.39	37.35	37.33	37.31
rat 32	E-e 10%	36.86	36.86	36.92	36.95	36.96	36.91	36.65	36.60	36.62
rat 33	E-e 10%	36.90	36.74	36.64	36.73	36.60	36.60	36.69	36.84	36.97
rat 22	E-e 20%	37.19	37.21	37.26	37.33	37.39	37.40	37.38	37.42	37.51
rat 21	E-e 20%	37.19	37.22	37.24	37.06	37.03	37.07	37.13	37.16	37.21
rat 28	E-e 20%	37.00	37.06	37.08	37.09	36.99	36.66	36.66	36.49	36.48
rat 29	E-e 20%	37.14	37.22	37.09	37.02	37.20	37.15	37.34	37.29	37.28
rat 5	S-s	38.38	38.40	38.40	38.37	38.33	38.32	38.29	38.26	38.23
rat 12	S-s	37.73	37.57	37.47	37.45	37.41	37.52	37.37	37.24	37.20
rat 13	S-s	37.30	37.11	37.12	37.31	37.42	37.20	37.14	37.04	37.15
rat 17	S-s	37.67	37.50	37.44	37.45	37.32	37.25	37.33	37.26	37.20
rat 20	S-s	37.87	37.78	37.78	37.89	38.21	38.12	37.96	37.93	37.82
rat 2	E-s	36.91	36.95	36.99	36.98	37.02	37.04	37.01	36.98	36.93
rat 27	E-s	37.47	37.26	37.32	37.37	37.36	37.36	37.32	37.29	37.26
rat 24	E-s	36.28	36.34	36.41	36.47	36.27	36.21	36.19	36.21	36.26
rat 31	E-s	38.28	38.19	38.25	38.39	38.56	38.50	38.13	38.02	37.98

Chapter 2, Experiment 1C
Temperatures (Celsius), Training Phase Day 12

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	E-e 10%	37.31	37.05	36.76	36.69	36.52	36.55	36.50	36.48	36.50
rat 4	E-e 10%	36.91	36.61	36.62	36.63	36.57	36.54	36.57	36.29	36.35
rat 6	E-e 10%	39.16	38.84	38.46	38.34	38.36	38.17	38.27	38.16	38.13
rat 32	E-e 10%	37.60	37.56	37.16	36.79	36.88	37.01	37.08	37.10	37.06
rat 33	E-e 10%	38.71	38.74	38.63	38.27	38.11	38.01	37.92	37.85	37.75
rat 22	E-e 20%	37.66	37.48	37.38	37.31	37.22	37.13	37.10	37.16	37.22
rat 21	E-e 20%	38.28	37.93	37.80	37.58	37.43	37.36	37.18	37.13	37.16
rat 28	E-e 20%	37.53	37.39	37.27	37.23	37.20	37.27	37.20	37.32	37.33
rat 29	E-e 20%	38.89	38.61	38.49	38.37	38.18	38.10	38.07	38.03	37.88
rat 5	S-s	39.28	39.33	39.26	39.05	38.96	38.69	38.55	38.40	38.51
rat 12	S-s	39.00	38.66	38.45	38.54	38.23	37.77	37.76	37.67	37.29
rat 13	S-s	38.80	38.71	38.59	38.48	38.35	38.17	37.90	37.63	37.53
rat 17	S-s	38.30	38.30	38.21	38.06	37.86	37.53	37.43	37.29	37.13
rat 20	S-s	38.20	38.30	38.18	38.02	37.88	37.59	37.73	37.77	37.15
rat 2	E-s	37.66	37.56	37.46	37.33	37.20	37.23	37.01	37.08	37.06
rat 27	E-s	38.53	38.36	38.12	38.25	38.20	38.10	37.91	37.50	37.57
rat 24	E-s	36.70	36.81	37.03	37.38	37.49	37.51	37.50	37.47	37.52
rat 31	E-s	38.33	38.34	38.08	37.82	37.50	37.38	37.36	37.35	37.40

Chapter 2, Experiment 1C
Temperatures (Celsius), Training Phase Day 12 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	E-e 10%	36.56	36.44	36.75	36.98	37.13	37.14	36.91	36.71	36.71
rat 4	E-e 10%	36.51	36.34	36.24	36.11	36.27	36.42	36.41	36.17	35.87
rat 6	E-e 10%	37.97	38.20	38.01	37.68	37.50	37.37	37.29	37.26	37.24
rat 32	E-e 10%	37.05	37.01	36.96	36.92	36.91	36.82	36.69	36.76	36.93
rat 33	E-e 10%	37.66	37.57	37.55	37.54	37.51	37.49	37.37	37.33	37.21
rat 22	E-e 20%	37.27	37.27	37.28	37.23	37.24	37.20	37.16	37.15	37.15
rat 21	E-e 20%	37.09	37.12	37.09	37.11	37.17	37.14	37.01	37.01	37.06
rat 28	E-e 20%	37.17	37.15	37.16	37.23	37.27	37.39	37.46	37.46	37.40
rat 29	E-e 20%	37.82	37.75	37.69	37.85	38.01	37.92	38.00	37.99	37.80
rat 5	S-s	38.48	38.58	38.53	38.47	38.37	38.29	38.33	38.30	38.32
rat 12	S-s	37.23	37.24	37.21	37.21	37.24	37.23	37.16	37.05	37.09
rat 13	S-s	37.50	37.36	37.27	37.20	37.16	37.20	37.24	37.02	36.59
rat 17	S-s	37.01	36.92	36.78	36.78	36.82	36.89	36.81	36.90	37.04
rat 20	S-s	37.02	37.14	37.19	37.15	37.21	37.24	37.06	36.99	37.04
rat 2	E-s	36.94	37.00	37.11	37.21	37.27	37.19	37.11	37.10	37.14
rat 27	E-s	37.53	37.60	37.59	37.50	37.33	37.39	37.33	37.29	37.21
rat 24	E-s	37.44	37.25	36.88	36.83	36.77	36.80	36.73	36.54	36.17
rat 31	E-s	37.42	37.49	37.52	37.56	37.53	37.46	37.44	37.41	37.33

Chapter 2, Experiment 1C
Temperatures (Celsius), Test Phase

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	E-e 10%	38.33	38.37	38.37	38.40	38.19	38.29	38.33	38.41	38.26
rat 4	E-e 10%	37.10	37.25	37.08	36.82	36.98	37.09	37.11	37.23	37.37
rat 6	E-e 10%	39.18	38.95	38.85	38.59	38.31	38.14	38.01	37.94	37.80
rat 32	E-e 10%	37.72	37.55	37.39	37.31	37.43	37.41	37.45	37.44	37.28
rat 33	E-e 10%	38.69	38.92	38.85	38.89	38.76	38.61	38.43	38.44	38.24
rat 22	E-e 20%	39.15	39.15	38.93	38.71	38.75	38.68	38.51	38.34	38.49
rat 21	E-e 20%	39.14	39.19	38.87	38.70	38.68	38.49	38.50	38.51	38.61
rat 28	E-e 20%	38.54	38.51	38.34	38.27	38.30	38.16	37.97	37.82	37.76
rat 29	E-e 20%	38.61	38.94	38.99	39.10	38.94	38.27	37.51	37.25	38.09
rat 5	S-s	39.56	39.47	39.29	39.33	39.18	39.13	39.09	39.11	39.17
rat 12	S-s	39.08	38.80	38.43	38.01	37.74	37.69	37.56	37.39	37.31
rat 13	S-s	37.99	38.21	38.22	38.15	38.04	37.78	37.71	37.81	37.82
rat 17	S-s	38.76	38.64	38.44	38.34	38.36	38.19	37.96	38.05	38.16
rat 20	S-s	38.85	38.80	38.61	38.39	38.16	37.96	38.01	38.12	38.01
rat 2	E-s	38.49	38.38	38.41	38.35	38.27	38.29	38.30	38.29	38.31
rat 27	E-s	37.73	38.00	37.82	37.69	37.75	37.49	37.16	37.05	37.03
rat 24	E-s	38.93	38.76	38.69	38.75	38.77	38.65	38.52	38.24	38.26
rat 31	E-s	38.43	38.66	38.48	38.17	37.82	37.44	37.25	37.26	37.17

Chapter 2, Experiment 1C
Temperatures (Celsius), Test Phase (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	E-e 10%	38.30	38.24	38.02	37.83	37.81	37.94	37.80	37.74	37.79
rat 4	E-e 10%	37.40	37.28	37.29	37.28	37.21	37.23	37.08	37.29	37.44
rat 6	E-e 10%	37.84	37.57	37.63	37.76	37.82	37.86	37.99	37.89	38.04
rat 32	E-e 10%	37.20	37.27	37.30	37.31	37.20	37.13	37.15	37.14	37.39
rat 33	E-e 10%	37.93	37.76	37.57	37.51	37.49	37.50	37.46	37.43	37.34
rat 22	E-e 20%	38.58	38.46	38.35	38.27	38.28	38.10	38.14	38.19	38.00
rat 21	E-e 20%	38.47	38.44	38.31	38.27	38.28	37.99	37.63	37.47	37.39
rat 28	E-e 20%	37.72	37.64	37.59	37.54	37.47	37.40	37.37	37.40	37.37
rat 29	E-e 20%	38.19	38.21	38.15	38.07	37.96	37.86	37.81	37.78	37.67
rat 5	S-s	39.15	39.12	39.12	39.15	39.14	39.13	39.00	38.92	38.91
rat 12	S-s	37.32	37.23	37.29	37.21	37.25	37.70	37.90	38.01	37.63
rat 13	S-s	38.01	38.00	37.74	37.61	37.42	37.38	37.26	37.00	37.03
rat 17	S-s	37.94	37.77	37.72	37.71	37.70	37.47	37.38	37.32	37.22
rat 20	S-s	37.90	37.60	37.79	37.84	37.47	37.35	37.35	37.29	37.24
rat 2	E-s	38.27	38.21	38.24	38.17	38.22	38.17	37.89	37.85	37.85
rat 27	E-s	37.07	37.03	36.84	36.78	36.84	36.86	36.87	36.88	36.99
rat 24	E-s	38.31	38.34	38.18	38.00	37.96	37.83	37.74	37.66	37.69
rat 31	E-s	37.09	37.11	37.09	37.10	37.08	37.15	37.10	37.12	37.19

APPENDIX D

Raw data collected for experiment 1D presented in Chapter 2

Chapter 2, Experiment 1D
Temperatures (Celsius), Baseline Day 4

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	E-e 10%	39.04	39.50	39.56	39.27	39.18	39.24	39.28	39.08	38.91
rat 9	E-e 10%	39.29	39.40	39.11	38.93	38.59	38.66	38.60	38.55	38.43
rat 19	E-e 10%	38.66	38.70	38.50	38.54	38.24	37.97	37.61	37.48	37.44
rat 16	E-e 10%	38.08	37.99	37.63	37.49	37.51	37.71	37.74	37.69	37.54
rat 3	E-e 10%	38.40	38.44	38.40	38.40	38.38	38.17	38.11	38.19	38.22
rat 6	E-e 10%	37.72	37.97	37.94	37.91	37.78	37.55	37.48	37.37	37.40
rat 9	E-e 10%	37.70	37.99	37.82	37.82	37.61	37.49	37.52	37.46	37.48
rat 15	E-e 10%	38.96	38.89	38.69	38.40	37.90	37.65	37.56	37.40	37.24
rat 2	E-e 10%	38.34	38.27	38.06	37.92	37.88	37.70	37.62	37.53	37.41
rat 7	E-e 10%	38.50	38.46	38.31	38.18	38.14	38.05	37.96	37.86	37.79
rat 14	E-e 10%	37.36	37.57	37.76	37.76	37.70	37.60	37.51	37.40	37.36
rat 12	E-e 20%	38.67	38.54	38.13	38.02	37.90	37.81	37.72	37.62	37.54
rat 13	E-e 20%	38.76	38.65	38.20	38.02	37.96	37.70	37.54	37.60	37.48
rat 15	E-e 20%	38.43	38.49	38.48	38.50	38.44	37.91	37.68	37.69	37.76
rat 16	E-e 20%	38.61	38.55	38.23	38.16	38.04	38.17	38.32	38.37	37.97
rat 17	E-e 20%	39.04	39.00	38.68	38.28	37.93	37.78	37.68	37.61	37.54
rat 14	E-e 20%	37.99	37.93	37.85	37.77	37.68	37.81	37.67	37.53	37.54
rat 12	E-e 20%	38.10	37.70	37.74	37.79	37.82	37.82	37.79	37.76	37.77
rat 13	E-e 20%	37.77	38.08	37.68	37.57	37.39	37.28	37.17	37.00	37.19
rat 16	E-e 20%	39.26	39.21	39.13	39.00	38.71	38.55	38.45	38.36	38.33
rat 15	E-e 20%	37.36	37.78	38.07	38.22	38.31	38.13	38.06	37.81	37.88
rat 1	E-e 5%	38.28	38.34	38.13	38.08	38.05	37.99	37.82	37.71	37.63
rat 11	E-e 5%	37.22	37.50	37.41	37.29	37.24	37.25	37.26	37.31	37.36
rat 4	E-e 5%	39.32	39.48	39.39	39.28	39.20	39.17	38.87	38.63	38.52
rat 5	E-e 5%	38.33	38.50	38.19	37.98	37.74	37.51	37.32	37.26	37.21
rat 13	E-e 5%	37.86	37.99	37.77	37.71	37.71	37.67	37.66	37.71	37.67
rat 7	E-e 5%	37.86	38.10	38.07	38.10	37.94	37.67	37.59	37.50	37.45
rat 18	E-e 5%	38.52	38.67	38.32	38.44	38.18	38.04	38.05	37.95	37.74
rat 8	E-e 5%	38.84	39.15	39.14	38.65	38.42	38.31	38.24	38.30	38.49
rat 3	E-e 5%	38.17	38.37	38.31	38.19	38.12	38.28	38.41	38.33	38.27
rat 11	E-e 5%	37.34	37.70	37.81	37.81	37.62	37.50	37.40	37.28	37.31
rat 9	E-e 5%	37.75	37.79	37.69	37.80	37.76	37.61	37.54	37.40	37.42

Chapter 2, Experiment 1D
Temperatures (Celsius), Baseline Day 4 (Cont.)

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 3	S-s	39.13	39.27	38.86	38.83	38.93	38.77	38.65	38.63	38.57
rat 4	S-s	38.12	38.36	38.24	37.95	37.75	37.67	37.41	37.31	37.37
rat 5	S-s	37.76	38.18	38.38	38.33	38.18	38.14	38.03	37.94	37.70
rat 8	S-s	38.46	38.20	38.11	38.12	37.89	37.76	37.63	37.60	37.58
rat 17	S-s	37.68	38.03	38.06	37.96	37.91	37.83	37.77	37.80	37.73
rat 20	S-s	37.61	37.77	37.79	37.78	37.67	37.59	37.56	37.46	37.38
rat 1	S-s	38.41	38.43	38.36	38.22	38.16	38.04	37.96	37.91	37.88
rat 2	S-s	38.22	38.25	38.25	38.34	38.34	38.40	38.51	38.54	38.46
rat 4	S-s	38.01	38.40	38.55	38.54	38.64	38.56	38.54	38.43	38.55
rat 6	S-s	37.46	37.49	37.28	37.09	37.07	37.15	37.21	37.04	37.04
rat 8	S-s	37.50	37.52	37.44	37.44	37.34	37.26	37.24	37.18	37.22
rat 10	S-s	37.50	37.51	37.48	37.27	37.11	37.09	36.99	36.89	36.87
rat 12	S-s	37.85	38.06	37.95	37.72	37.84	37.80	37.75	37.71	37.54
rat 4	E-s	38.19	38.40	38.37	38.32	38.15	37.82	37.69	37.60	37.60
rat 7	E-s	38.59	38.75	38.70	38.63	38.46	38.38	38.31	38.02	37.56
rat 8	E-s	38.26	38.56	38.50	38.35	38.33	38.23	38.34	38.29	38.24
rat 14	E-s	37.68	37.85	37.76	37.58	37.44	37.40	37.41	37.43	37.44
rat 3	E-s	36.76	37.19	37.55	37.56	37.33	37.03	36.97	37.02	36.98
rat 8	E-s	37.93	38.49	38.52	38.42	38.19	37.96	37.78	37.63	37.54
rat 10	E-s	37.71	38.15	38.37	38.36	38.23	38.19	37.86	37.54	37.49
rat 12	E-s	38.67	38.93	39.04	39.08	39.00	38.75	38.55	38.40	38.15
rat 13	E-s	37.97	38.30	38.43	38.54	38.56	38.50	38.20	38.10	37.66
rat 1	S-e 5%	38.62	38.54	38.64	38.22	38.08	38.35	38.40	38.30	38.17
rat 2	S-e 5%	38.51	38.50	38.42	38.25	38.17	37.96	38.06	38.02	37.87
rat 3	S-e 5%	38.37	38.45	38.38	38.08	37.83	37.82	37.59	37.70	37.76
rat 11	S-e 5%	38.61	38.57	38.20	37.74	37.51	37.32	37.22	37.17	37.15
rat 4	S-e 5%	38.76	38.90	38.79	38.64	38.53	38.44	38.27	38.20	38.10
rat 5	S-e 5%	37.74	38.18	38.40	38.55	38.30	38.16	38.09	37.97	37.83
rat 7	S-e 5%	37.57	37.96	38.25	38.27	38.18	38.09	37.88	37.76	37.61
rat 9	S-e 5%	38.46	38.72	38.68	38.59	38.56	38.48	38.24	38.01	37.70
rat 15	S-e 5%	38.08	38.17	38.04	37.84	37.58	37.47	37.43	37.28	37.20
rat 5	S-e 20%	37.10	37.49	37.55	37.57	37.53	37.35	37.36	37.45	37.36
rat 9	S-e 20%	38.16	38.23	38.05	38.22	38.28	38.21	38.02	37.94	37.88
rat 10	S-e 20%	38.67	38.80	38.58	38.38	38.52	38.32	38.19	38.14	38.06
rat 15	S-e 20%	37.82	38.07	37.97	37.85	37.74	37.80	37.59	37.37	37.25
rat 1	S-e 20%	38.79	38.90	38.83	38.46	38.36	38.28	38.31	38.14	37.90
rat 2	S-e 20%	38.19	38.62	38.76	38.78	38.67	38.52	38.48	38.40	38.34
rat 6	S-e 20%	38.08	38.29	38.14	38.08	38.23	38.11	37.87	37.89	37.86
rat 11	S-e 20%	38.70	38.84	38.73	38.56	38.37	38.30	38.55	38.66	38.45
rat 14	S-e 20%	38.53	38.40	38.16	38.10	38.08	37.86	37.53	37.37	37.32

Chapter 2, Experiment 1D
Temperatures (Celsius), Baseline Day 4 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	E-e 10%	38.74	38.63	38.52	38.48	38.56	38.45	38.40	38.39	38.40
rat 9	E-e 10%	38.33	38.26	38.26	38.23	38.12	37.92	37.86	37.91	37.93
rat 19	E-e 10%	37.39	37.68	37.61	37.52	37.46	37.43	37.44	37.56	37.53
rat 16	E-e 10%	37.45	37.41	37.39	37.42	37.43	37.41	37.42	37.47	37.52
rat 3	E-e 10%	38.14	37.86	37.70	37.54	37.40	37.35	37.30	37.31	37.19
rat 6	E-e 10%	37.31	37.26	37.27	37.23	37.19	37.14	37.09	37.09	37.05
rat 9	E-e 10%	37.43	37.42	37.34	37.22	37.15	37.06	37.04	37.03	37.02
rat 15	E-e 10%	37.31	37.29	37.31	37.30	37.26	37.24	37.23	37.26	37.29
rat 2	E-e 10%	37.28	37.22	37.15	37.10	37.09	37.06	37.02	37.00	37.00
rat 7	E-e 10%	37.75	37.69	37.74	37.77	37.77	37.72	37.73	37.75	37.76
rat 14	E-e 10%	37.28	37.22	37.19	37.16	37.19	37.12	37.08	37.07	37.09
rat 12	E-e 20%	37.51	37.50	37.49	37.42	37.40	37.41	37.42	37.43	37.36
rat 13	E-e 20%	37.41	37.45	37.41	37.30	37.34	37.33	37.31	37.34	37.36
rat 15	E-e 20%	37.81	37.79	37.81	37.88	37.89	37.82	37.73	37.77	37.67
rat 16	E-e 20%	37.84	37.82	37.87	37.94	37.96	37.97	37.93	37.91	38.01
rat 17	E-e 20%	37.50	37.48	37.51	37.47	37.46	37.43	37.53	37.54	37.54
rat 14	E-e 20%	37.37	37.20	37.14	37.16	37.18	37.12	37.11	37.20	37.22
rat 12	E-e 20%	37.76	37.74	37.78	37.68	37.49	37.47	37.45	37.41	37.36
rat 13	E-e 20%	37.25	37.18	37.13	37.13	37.15	37.11	37.18	36.98	37.07
rat 16	E-e 20%	38.36	38.30	38.32	38.35	38.36	38.33	38.18	38.192	38.22
rat 15	E-e 20%	37.68	37.44	37.27	37.14	36.99	36.91	36.80	36.56	36.59
rat 1	E-e 5%	37.50	37.40	37.37	37.28	37.24	37.20	37.13	37.06	37.00
rat 11	E-e 5%	37.37	37.40	37.43	37.44	37.44	37.47	37.35	37.27	37.28
rat 4	E-e 5%	38.39	38.28	38.28	38.26	38.20	38.15	38.09	38.05	38.09
rat 5	E-e 5%	37.16	37.11	37.06	37.01	37.06	37.09	37.04	36.86	36.77
rat 13	E-e 5%	37.60	37.63	37.41	37.29	37.28	37.23	37.24	37.13	37.33
rat 7	E-e 5%	37.40	37.30	37.26	37.20	37.28	37.17	37.10	37.11	37.10
rat 18	E-e 5%	37.67	37.61	37.59	37.56	37.56	37.60	37.51	37.35	37.18
rat 8	E-e 5%	38.47	38.30	38.21	38.24	38.27	38.15	38.16	38.20	38.27
rat 3	E-e 5%	38.07	37.83	37.76	37.70	37.61	37.59	37.66	37.53	37.43
rat 11	E-e 5%	37.19	37.09	37.04	37.14	37.13	36.94	36.91	36.73	36.72
rat 9	E-e 5%	37.43	37.42	37.36	37.37	37.34	38.97	38.99	39.00	38.88

Chapter 2, Experiment 1D
Temperatures (Celsius), Baseline Day 4 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 3	S-s	38.55	38.35	38.43	38.22	38.14	38.05	38.00	37.90	37.82
rat 4	S-s	37.43	37.47	37.47	37.37	37.28	37.22	37.22	37.27	37.46
rat 5	S-s	37.66	37.58	37.56	37.42	37.36	37.29	37.26	37.25	37.19
rat 8	S-s	37.50	37.51	37.50	37.44	37.47	37.46	37.44	37.39	37.42
rat 17	S-s	37.63	37.58	37.52	37.41	37.47	37.60	37.88	38.07	38.21
rat 20	S-s	37.38	37.40	37.36	37.38	37.41	37.45	37.46	37.43	37.31
rat 1	S-s	37.73	37.58	37.48	37.39	37.33	37.25	37.22	37.23	37.23
rat 2	S-s	38.32	38.22	38.06	38.04	38.04	37.95	37.90	37.82	37.80
rat 4	S-s	38.95	38.82	38.51	38.16	37.90	37.16	37.13	37.14	37.13
rat 6	S-s	37.08	37.10	37.12	37.07	37.07	37.12	37.22	37.24	37.13
rat 8	S-s	37.17	37.04	36.82	36.84	36.91				
rat 10	S-s	36.92	36.90	36.86	36.75	36.69	36.64	36.60	36.64	36.63
rat 12	S-s	37.46	37.39	37.30	37.22	37.16	37.30	37.13	37.04	37.00
rat 4	E-s	37.45	37.41	37.33	37.27	37.35	37.32	37.26	37.15	37.01
rat 7	E-s	37.40	37.39	37.34	37.32	37.25	37.24	37.15	37.21	37.10
rat 8	E-s	38.05	37.90	37.91	37.53	37.40	37.39	37.34	37.28	36.98
rat 14	E-s	37.41	37.36	37.37	37.38	37.43	37.41	37.25	37.27	37.30
rat 3	E-s	36.99	37.13	37.12	36.98	36.94	36.89	36.92	36.99	37.00
rat 8	E-s	37.45	37.38	37.29	37.21	37.18	37.16	37.16	37.14	37.07
rat 10	E-s	37.47	37.33	37.25	37.22	37.21	37.20	37.13	37.06	37.14
rat 12	E-s	37.94	37.81	37.73	37.68	37.61	37.53	37.55	37.52	37.44
rat 13	E-s	37.64	37.46	37.48	37.61	37.59	37.54	37.46	37.35	37.25
rat 1	S-e 5%	38.19	38.07	38.05	38.10	38.04	37.65	37.42	37.59	37.72
rat 2	S-e 5%	37.76	37.59	37.56	37.46	37.36	37.29	37.29	37.16	37.06
rat 3	S-e 5%	37.62	37.45	37.34	37.33	37.33	37.40	37.33	37.22	37.14
rat 11	S-e 5%	36.99	36.90	36.86	36.82	36.82	36.80	36.78	36.82	36.99
rat 4	S-e 5%	37.98	37.95	37.79	37.68	37.65	37.63	37.56	37.42	37.41
rat 5	S-e 5%	37.75	37.60	37.29	37.50	37.54	37.41	37.30	37.22	37.24
rat 7	S-e 5%	37.34	37.01	36.93	36.94	37.01	37.03	37.08	37.03	36.99
rat 9	S-e 5%	37.64	37.62	37.50	37.39	37.31	37.26	37.12	36.91	36.88
rat 15	S-e 5%	37.19	37.20	37.13	37.08	36.99	36.97	36.94	36.98	36.96
rat 5	S-e 20%	37.02	36.95	36.96	37.05	37.06	37.14	37.17	37.20	37.15
rat 9	S-e 20%	37.58	37.25	37.18	37.15	37.18	37.13	37.13	37.16	37.09
rat 10	S-e 20%	37.92	37.81	37.80	37.87	37.85	37.86	37.83	37.83	37.82
rat 15	S-e 20%	37.23	37.20	37.04	37.03	37.05	37.02	36.98	36.91	36.93
rat 1	S-e 20%	37.66	37.59	37.65	37.75	37.76	37.48	37.40	37.41	37.41
rat 2	S-e 20%	37.98	37.94	37.73	37.51	37.52	37.55	37.54	37.50	37.44
rat 6	S-e 20%	37.78	37.64	37.51	37.36	37.24	37.19	37.16	37.09	37.03
rat 11	S-e 20%	38.30	38.35	38.27	38.14	38.11	38.05	37.99	38.01	38.04
rat 14	S-e 20%	37.28	37.33	37.29	37.26	37.25	37.27	37.28	37.30	37.35

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 1

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	ethanol	36.10	36.11	36.14	36.23	36.19	36.05	36.04	36.16	36.29
rat 2	ethanol	37.26	37.02	36.96	37.04	36.83	36.70	36.86	36.94	36.96
rat 3	ethanol	36.84	36.55	36.46	36.42	36.31	36.06	36.10	36.22	36.44
rat 4	ethanol	38.71	38.37	38.21	38.22	38.23	38.20	38.04	38.00	37.99
rat 5	ethanol	37.87	37.81	37.63	37.49	37.27	37.14	37.25	37.23	37.13
rat 6	ethanol	36.69	36.43	36.29	36.34	36.44	36.51	36.39	36.30	36.27
rat 7	ethanol	36.28	36.15	36.06	35.82	35.82	35.91	36.01	36.10	36.21
rat 8	ethanol	38.06	37.93	37.95	37.98	37.97	38.06	38.13	37.95	37.95
rat 9	ethanol	37.25	36.92	36.67	36.76	36.79	36.80	36.81	36.73	36.51
rat 11	ethanol	37.41	37.32	37.22	37.27	36.83	36.42	36.25	36.46	36.61
rat 12	ethanol	36.24	36.23	36.05	35.98	36.13	36.12	36.21	36.27	36.25
rat 13	ethanol	37.34	37.25	37.24	37.13	37.24	37.22	36.89	37.10	37.20
rat 14	ethanol	37.14	37.03	37.13	37.32	37.35	37.41	37.35	37.41	37.44
rat 15	ethanol	37.64	37.27	37.18	37.34	37.43	37.22	37.09	37.10	37.09
rat 16	ethanol	38.33	38.16	38.01	37.84	37.78	37.51	37.45	37.48	37.47
rat 18	ethanol	37.75	37.67	37.44	37.28	37.15	37.05	37.10	37.18	37.04
rat 19	ethanol	36.30	36.11	36.00	36.04	36.11	36.38	36.57	36.69	36.75
rat 20	ethanol	37.06	36.69	36.51	36.41	36.66	36.74	36.82	36.75	36.72
rat 1	ethanol	37.89	37.35	36.99	36.78	36.83	37.05	37.22	37.32	37.20
rat 7	ethanol	36.82	36.12	35.68	35.12	35.27	35.52	34.98	34.93	35.26
rat 9	ethanol	38.56	38.37	38.30	38.32	38.21	38.10	37.98	37.87	37.92
rat 12	ethanol	37.70	37.30	36.95	37.00	37.07	37.12	37.23	37.35	37.42
rat 13	ethanol	37.80	37.23	36.99	37.03	37.15	37.18	37.21	37.25	37.23
rat 14	ethanol	37.98	38.34	38.57	38.44	38.26	38.01	37.89	37.79	37.72
rat 15	ethanol	37.03	36.86	36.70	36.56	36.44	36.47	36.73	36.83	36.84
rat 16	ethanol	37.19	37.10	37.09	37.14	37.22	37.22	37.16	37.08	37.17
rat 17	ethanol	37.14	37.08	37.17	37.20	37.15	37.19	37.22	37.21	37.14
rat 18	ethanol	36.25	36.06	36.05	36.13	35.90	35.66	35.95	36.19	35.92
rat 19	ethanol	37.87	37.82	37.71	37.38	37.29	37.34	37.38	37.44	37.26

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 1 (Cont.)

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 2	ethanol	37.52	37.53	37.62	37.52	37.70	37.70	37.72	37.67	37.32
rat 3	ethanol	37.05	37.15	37.07	36.98	36.89	36.85	36.84	36.87	36.78
rat 4	ethanol	38.19	38.28	38.40	38.34	38.33	38.21	38.03	37.94	37.85
rat 6	ethanol	36.70	36.46	36.18	36.00	36.05	36.16	36.23	36.35	36.42
rat 7	ethanol	37.15	36.93	36.69	36.53	36.58	36.67	36.70	36.73	36.81
rat 8	ethanol	36.70	36.51	36.40	36.29	36.34	36.16	36.08	36.21	36.45
rat 9	ethanol	36.64	36.39	36.27	36.40	36.38	36.44	36.47	36.50	36.59
rat 11	ethanol	36.83	36.62	36.51	36.40	36.47	36.54	36.60	36.63	36.53
rat 12	ethanol	37.19	37.06	36.99	36.93	36.87	36.74	36.59	36.76	36.85
rat 13	ethanol	37.20	36.80	36.52	36.61	36.69	36.74	36.80	36.59	36.43
rat 14	ethanol	37.29	37.08	36.96	36.83	36.76	36.71	36.56	36.60	36.71
rat 15	ethanol	37.19	37.17	37.40	37.27	37.19	37.12	37.10	37.09	36.98
rat 16	ethanol	38.58	38.57	38.40	38.29	38.21	38.00	37.93	37.91	37.89
rat 4	ethanol	36.69	36.65	36.42	36.37	36.43	36.59	36.35	36.30	36.50
rat 7	ethanol	37.53	37.16	36.95	37.01	37.00	37.06	37.11	37.31	37.35
rat 8	ethanol	37.48	37.32	37.06	36.97	36.88	36.83	36.91	36.97	37.06
rat 13	ethanol	37.54	37.46	37.50	37.38	37.22	37.13	37.24	37.37	37.31
rat 3	ethanol	36.93	36.56	36.38	36.29	36.18	36.05	36.00	35.96	35.65
rat 8	ethanol	37.57	37.41	37.29	37.15	37.05	36.83	36.73	36.67	36.62
rat 10	ethanol	36.87	36.68	36.61	36.55	36.58	36.66	36.71	36.63	36.48
rat 12	ethanol	37.90	37.73	37.46	37.33	37.35	37.40	37.38	37.38	37.32
rat 13	ethanol	38.24	38.14	37.97	37.81	37.55	37.41	37.32	37.39	37.40

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 1 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	ethanol	36.42	36.42	36.20	36.03	36.17	36.29	36.38	36.47	36.52
rat 2	ethanol	36.95	36.95	36.97	36.98	37.01	36.99	36.98	36.97	36.98
rat 3	ethanol	36.63	36.81	36.96	37.04	37.09	36.99	36.46	36.25	36.47
rat 4	ethanol	37.99	37.98	38.01	38.07	38.21	38.12	38.22	38.27	38.11
rat 5	ethanol	37.05	36.86	36.81	36.81	36.86	36.89	36.88	36.82	36.84
rat 6	ethanol	36.30	36.37	36.46	36.25	36.09	36.10	36.09	36.16	36.22
rat 7	ethanol	36.21	36.05	36.08	35.96	35.91	36.04	36.20	36.29	36.36
rat 8	ethanol	37.91	37.91	37.98	38.06	38.14	38.18	38.17	38.19	38.21
rat 9	ethanol	36.56	36.57	36.51	36.46	36.44	36.24	36.20	36.30	36.44
rat 11	ethanol	36.73	36.82	36.85	36.89	36.92	36.71	36.51	36.72	36.80
rat 12	ethanol	36.20	36.25	36.33	36.39	36.32	36.43	36.47	36.53	36.57
rat 13	ethanol	37.28	37.34	37.38	37.40	37.41	37.43	37.48	37.53	37.63
rat 14	ethanol	37.53	37.45	37.41	37.39	37.37	37.39	37.34	37.21	37.18
rat 15	ethanol	37.09	37.15	37.20	37.24	37.26	37.31	37.28	37.25	37.27
rat 16	ethanol	37.43	37.39	37.37	37.40	37.43	37.44	37.47	37.49	37.36
rat 18	ethanol	36.95	36.93	36.93	37.00	36.83	36.76	36.74	36.74	36.82
rat 19	ethanol	36.62	36.42	36.47	36.58	36.70	36.79	36.87	36.97	37.04
rat 20	ethanol	36.75	36.78	36.65	36.72	36.94	36.97	36.94	36.93	36.97
rat 1	ethanol	36.99	37.11	37.16	37.13	37.13	37.20	37.33	37.47	37.62
rat 7	ethanol	35.46	35.68	35.86	35.96	36.05	36.17	36.32	36.42	36.48
rat 9	ethanol	38.16	38.50	38.53	38.25	38.23	38.01	37.94	37.96	37.97
rat 12	ethanol	37.45	37.43	37.22	36.98	36.92	36.97	37.03	37.06	37.09
rat 13	ethanol	37.21	37.09	37.04	37.02	37.04	37.10	37.17	37.24	37.28
rat 14	ethanol	37.71	37.67	37.63	37.59	37.61	37.55	37.54	37.63	37.62
rat 15	ethanol	36.89	36.99	37.08	37.22	37.36	37.39	37.14	37.04	37.10
rat 16	ethanol	37.19	37.27	37.20	37.21	37.26	37.36	37.47	37.54	37.66
rat 17	ethanol	37.18	36.98	36.89	37.10	37.10	37.18	37.10	36.98	37.06
rat 18	ethanol	35.66	35.56	35.87	36.26	35.43	35.38	35.65	35.88	36.05
rat 19	ethanol	37.07	37.03	37.16	37.23	37.29	37.30	37.39	37.50	37.62

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 1 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 2	ethanol	37.27	37.27	37.26	37.24	37.20	37.25	37.30	37.34	37.28
rat 3	ethanol	36.79	36.87	36.92	36.82	36.78	36.82	36.86	36.88	37.07
rat 4	ethanol	37.64	37.55	37.30	37.32	37.35	37.22	37.22	37.18	37.21
rat 6	ethanol	36.12	35.98	35.99	36.08	36.16	36.22	36.29	36.37	36.46
rat 7	ethanol	36.88	36.79	36.59	36.48	36.45	36.45	36.49	36.51	36.57
rat 8	ethanol	36.58	36.59	36.64	36.69	36.72	36.69	36.77	36.62	36.69
rat 9	ethanol	36.72	36.84	36.95	37.04	37.06	37.07	37.08	37.09	37.13
rat 11	ethanol	36.28	36.23	36.41	36.46	36.49	36.54	36.56	36.59	36.66
rat 12	ethanol	36.90	36.96	36.99	37.03	37.00	36.82	36.57	36.51	36.35
rat 13	ethanol	36.40	36.49	36.56	36.62	36.70	36.72	36.75	36.78	36.83
rat 14	ethanol	36.78	36.88	36.99	37.07	37.13	37.19	37.17	37.16	37.18
rat 15	ethanol	36.74	36.75	36.79	36.90	36.91	36.94	36.98	37.01	37.05
rat 16	ethanol	37.88	37.91	37.99	38.02	38.05	37.90	37.87	37.82	37.82
rat 4	ethanol	36.58	36.62	36.60	36.37	36.23	36.20	36.29	36.44	36.54
rat 7	ethanol	36.83	36.85	36.92	36.87	36.64	37.00	36.83	36.57	36.85
rat 8	ethanol	37.10	37.07	37.18	37.04	36.84	36.95	37.00	36.97	37.05
rat 13	ethanol	37.31	37.31	37.30	37.25	37.26	37.30	37.29	37.34	37.35
rat 3	ethanol	35.40	35.49	35.46	35.67	35.75	35.73	35.71	35.65	35.51
rat 8	ethanol	36.42	36.36	36.35	36.42	36.46	36.45	36.42	36.43	36.40
rat 10	ethanol	36.56	36.52	36.42	36.47	36.44	36.40	36.48	36.58	36.66
rat 12	ethanol	37.35	37.36	37.34	37.31	37.33	37.36	37.41	37.42	37.45
rat 13	ethanol	37.48	37.41	37.33	37.26	37.18	37.13	37.12	37.07	37.15

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 1 (Cont.)

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 3	saline	39.56	39.05	39.27	39.04	38.72	38.72	38.84	38.77	38.16
rat 4	saline	38.46	38.62	38.38	38.44	38.56	38.35	38.08	38.04	37.99
rat 5	saline	38.45	38.73	38.57	38.41	38.36	38.10	38.07	37.94	37.66
rat 8	saline	38.54	38.62	38.48	38.21	38.40	38.25	38.00	37.85	37.64
rat 17	saline	38.35	38.43	38.35	38.42	38.34	38.08	37.86	37.73	37.68
rat 10	saline	37.01	37.18	37.30	37.33	37.37	37.44	37.30	37.06	37.17
rat 1	saline	38.26	38.28	38.35	38.39	38.25	38.06	37.78	37.75	37.69
rat 1	saline	38.55	38.41	38.34	38.13	38.16	37.99	38.08	38.15	37.86
rat 2	saline	38.68	38.98	38.81	38.50	38.38	38.36	38.08	37.75	37.59
rat 3	saline	37.91	38.18	38.21	38.12	38.19	38.14	38.00	37.91	37.79
rat 4	saline	36.69	36.65	36.42	36.37	36.43	36.59	36.35	36.30	36.50
rat 7	saline	37.53	37.16	36.95	37.01	37.00	37.06	37.11	37.31	37.35
rat 8	saline	37.48	37.32	37.06	36.97	36.88	36.83	36.91	36.97	37.06
rat 13	saline	37.54	37.46	37.50	37.38	37.22	37.13	37.24	37.37	37.31
rat 14	saline	38.24	38.18	37.93	37.84	37.84	37.66	37.65	37.55	37.35
rat 1	saline	38.27	38.50	38.74	38.79	38.60	38.49	38.40	38.27	38.13
rat 2	saline	38.19	38.58	38.73	38.81	38.89	38.78	38.59	38.46	38.28
rat 4	saline	38.75	39.01	38.93	38.88	38.70	38.52	38.41	38.36	38.36
rat 5	saline	37.69	38.14	38.46	38.58	38.57	38.49	38.26	38.27	38.16
rat 6	saline	37.97	38.21	38.54	38.54	38.30	38.04	37.90	37.82	37.73
rat 7	saline	38.49	38.65	38.63	38.64	38.50	38.37	38.25	38.07	37.96
rat 9	saline	38.39	38.86	38.88	38.84	38.77	38.68	38.51	38.36	38.38
rat 11	saline	38.64	38.74	38.78	38.69	38.55	38.35	38.20	38.07	38.02
rat 14	saline	38.65	38.50	38.11	37.98	37.98	37.74	37.60	37.53	37.52
rat 15	saline	38.32	38.37	38.35	38.14	37.92	37.80	37.38	37.28	37.21

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 1 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 3	saline	38.60	38.54	38.37	38.37	38.27	38.21	38.33	38.30	38.28
rat 4	saline	37.86	37.66	37.54	37.49	37.52	37.45	37.50	37.57	37.64
rat 5	saline	37.59	37.52	37.51	37.46	37.49	37.50	37.49	37.52	37.56
rat 8	saline	37.54	37.53	37.68	37.74	37.78	37.89	37.95	37.99	38.22
rat 17	saline	37.73	37.68	37.65	37.61	37.53	37.37	37.33	37.28	37.35
rat 10	saline	37.18	37.13	37.10	37.06	37.07	37.03	36.99	36.97	36.95
rat 1	saline	37.65	37.53	37.42	37.35	37.29	37.25	37.18	37.23	37.09
rat 1	saline	37.87	38.02	37.97	37.74	37.60	37.55	37.55	37.34	37.36
rat 2	saline	37.42	37.51	37.52	37.50	37.37	37.27	37.34	37.31	37.30
rat 3	saline	37.84	37.79	37.52	37.44	37.36	37.29	37.29	37.21	37.19
rat 4	saline	36.58	36.62	36.60	36.37	36.23	36.20	36.29	36.44	36.54
rat 7	saline	36.83	36.85	36.92	36.87	36.64	37.00	36.83	36.57	36.85
rat 8	saline	37.10	37.07	37.18	37.04	36.84	36.95	37.00	36.97	37.05
rat 13	saline	37.31	37.31	37.30	37.25	37.26	37.30	37.29	37.34	37.35
rat 14	saline	37.28	37.26	37.29	37.29	37.18	37.08	37.06	37.18	37.22
rat 1	saline	37.81	37.66	37.57	37.71	37.83	37.59	37.36	37.27	37.02
rat 2	saline	38.24	38.04	38.04	37.98	37.91	37.78	37.61	37.42	37.32
rat 4	saline	38.41	38.37	38.35	38.28	38.08	37.94	37.86	37.85	37.83
rat 5	saline	37.99	38.03	38.14	38.20	38.19	38.00	37.71	37.65	37.61
rat 6	saline	37.72	37.68	37.49	37.44	37.44	37.43	37.37	37.28	37.14
rat 7	saline	37.85	37.62	37.51	37.45	37.19	36.93	36.84	36.81	36.82
rat 9	saline	38.41	38.27	38.16	38.07	37.98	37.87	37.65	37.56	37.52
rat 11	saline	38.00	37.96	37.96	37.88	37.79	37.80	37.82	37.74	37.56
rat 14	saline	37.57	37.55	37.51	37.52	37.46	37.38	37.39	37.39	37.01
rat 15	saline	37.12	37.08	37.04	37.03	37.06	36.86	36.82	36.87	37.00

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 12

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	E-e 10%	38.55	38.27	37.91	37.87	38.01	37.88	37.80	37.84	38.05
rat 9	E-e 10%	38.40	38.26	38.21	38.36	38.47	38.47	38.42	38.47	38.45
rat 19	E-e 10%	37.42	37.47	37.39	37.21	37.09	37.08	37.19	37.26	37.32
rat 16	E-e 10%	37.51	37.40	37.28	37.47	37.48	37.31	37.37	37.39	37.35
rat 3	E-e 10%	36.92	36.86	36.90	37.01	36.96	36.96	36.94	36.90	36.99
rat 6	E-e 10%	35.98	36.13	36.35	36.45	36.51	36.53	36.40	36.58	36.66
rat 9	E-e 10%	36.73	36.60	36.51	36.51	36.47	36.39	36.31	36.48	36.48
rat 15	E-e 10%	38.96	38.82	38.62	38.48	38.18	38.26	38.01	37.53	37.36
rat 2	E-e 10%	36.92	36.86	36.81	36.83	36.73	36.60	36.61	36.62	36.69
rat 7	E-e 10%	37.86	37.52	37.33	37.11	37.19	37.39	37.35	36.98	36.93
rat 14	E-e 10%	37.32	37.23	36.98	36.88	36.89	36.92	36.97	37.00	37.04
rat 12	E-e 20%	38.54	38.49	38.26	38.03	38.04	37.90	37.73	37.65	37.62
rat 13	E-e 20%	37.52	37.34	37.28	37.32	37.36	37.42	37.44	37.39	37.28
rat 15	E-e 20%	38.09	38.02	37.76	37.62	37.72	37.76	37.52	37.50	37.52
rat 16	E-e 20%	38.03	37.91	37.77	37.63	37.47	37.34	37.24	37.25	37.18
rat 17	E-e 20%	37.84	37.46	37.24	37.40	37.57	37.43	37.37	37.45	37.54
rat 14	E-e 20%	35.47	35.26	35.70	35.75	36.10	36.32	36.23	36.24	36.21
rat 12	E-e 20%	37.33	37.18	37.17	37.21	37.13	37.12	37.02	37.01	37.08
rat 13	E-e 20%	36.56	36.40	36.36	36.47	36.73	36.85	36.84	36.85	36.87
rat 16	E-e 20%	39.51	39.62	39.43	39.14	38.86	38.84	38.74	38.63	38.58
rat 15	E-e 20%	36.76	36.96	37.17	36.95	36.80	36.73	36.71	36.62	36.58
rat 1	E-e 5%	37.28	36.96	36.85	36.84	36.79	36.73	36.85	36.87	36.72
rat 11	E-e 5%	37.29	36.98	36.74	36.72	36.81	37.03	37.06	37.11	37.20
rat 4	E-e 5%	39.25	39.15	39.03	38.71	38.59	38.62	38.69	38.68	38.68
rat 5	E-e 5%	36.79	36.87	36.64	36.64	36.68	36.58	36.48	36.31	36.27
rat 13	E-e 5%	37.49	37.53	37.49	37.43	37.47	37.44	37.41	37.17	37.22
rat 7	E-e 5%	36.72	36.54	36.58	36.37	36.51	36.64	36.75	36.83	36.91
rat 18	E-e 5%	37.84	37.51	37.20	37.31	37.36	37.17	37.40	37.11	36.85
rat 8	E-e 5%	39.07	39.29	39.37	39.11	39.10	38.87	38.79	38.83	38.88
rat 3	E-e 5%	37.36	37.35	37.14	37.05	37.01	36.92	36.90	36.81	36.67
rat 11	E-e 5%	36.99	37.13	37.01	36.98	36.82	36.69	36.50	36.52	36.66
rat 9	E-e 5%	36.93	37.01	36.83	36.72	36.59	36.61	36.57	36.72	36.81

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 12 (Cont.)

Subject	Group									
rat 3	S-s	38.96	39.23	39.32	39.18	39.11	39.04	38.87	38.73	38.47
rat 4	S-s	37.32	37.24	37.25	37.29	37.41	37.49	37.56	37.54	37.47
rat 5	S-s	39.05	39.00	38.94	38.93	38.76	38.62	38.43	38.28	38.16
rat 8	S-s	37.29	37.51	37.61	37.62	37.38	37.27	37.25	37.11	37.00
rat 17	S-s	37.77	37.94	37.97	37.90	37.67	37.54	37.61	37.52	37.35
rat 20	S-s	37.22	37.34	37.33	37.17	37.13	37.11	37.21	37.31	37.17
rat 1	S-s	38.46	38.58	38.49	38.42	38.09	37.92	37.79	37.55	37.48
rat 2	S-s	38.19	38.31	38.13	38.19	38.49	38.42	38.11	37.95	37.85
rat 4	S-s	38.62	38.56	38.39	38.44	38.53	38.22	38.20	38.44	38.49
rat 6	S-s	38.16	38.16	38.15	38.21	38.05	37.74	37.57	37.68	37.71
rat 8	S-s	37.42	37.58	37.91	38.06	37.87	37.61	37.53	37.41	37.20
rat 10	S-s	37.17	37.45	37.55	37.66	37.41	37.01	36.96	36.97	36.88
rat 12	S-s	37.98	38.13	38.11	37.85	37.55	37.57	37.27	37.10	37.11
rat 4	E-s	37.70	37.74	37.78	37.68	37.78	37.49	37.40	37.33	37.26
rat 7	E-s	37.49	37.62	37.73	37.81	37.34	36.99	36.99	36.96	37.04
rat 8	E-s	37.90	38.37	38.33	38.20	38.12	37.93	37.92	38.06	38.04
rat 14	E-s	37.18	37.41	37.46	37.39	37.33	37.27	37.23	37.12	37.08
rat 3	E-s	35.53	35.49	35.20	35.20	34.93	34.57	34.47	34.70	35.00
rat 8	E-s	37.36	37.58	37.73	37.72	37.64	37.56	37.30	37.21	37.09
rat 10	E-s	36.80	36.39	36.07	36.17	36.39	36.35	36.11	36.35	36.42
rat 12	E-s	38.03	38.26	38.51	38.62	38.19	38.00	37.95	37.83	37.74
rat 13	E-s	38.31	38.62	38.64	38.51	38.14	37.82	37.60	37.50	37.41
rat 1	S-e 5%	37.85	38.03	37.94	38.14	38.20	38.09	37.93	37.76	37.59
rat 2	S-e 5%	38.70	38.76	38.66	38.50	38.50	38.41	38.26	38.29	38.18
rat 3	S-e 5%	37.77	37.92	37.94	37.77	37.54	37.52	37.35	37.34	37.31
rat 11	S-e 5%	38.34	38.11	38.15	38.34	38.21	37.77	37.56	37.64	37.79
rat 4	S-e 5%	37.27	37.50	37.58	37.57	37.48	37.35	37.30	37.36	37.40
rat 5	S-e 5%	38.26	38.67	38.60	38.29	38.07	37.94	37.63	37.47	37.41
rat 7	S-e 5%	37.47	37.93	38.16	38.42	38.51	38.53	38.36	38.10	37.74
rat 9	S-e 5%	37.22	37.60	37.85	37.85	38.00	37.96	37.76	37.71	37.67
rat 15	S-e 5%	37.30	37.80	37.96	37.80	37.65	37.88	37.74	37.67	37.64
rat 5	S-e 20%	37.93	37.97	37.79	37.86	37.73	37.57	37.36	37.31	37.29
rat 9	S-e 20%	38.90	38.74	38.71	38.64	38.59	38.62	38.56	38.13	37.91
rat 10	S-e 20%	37.98	38.28	38.51	38.30	38.27	38.17	37.97	37.86	37.79
rat 15	S-e 20%	38.35	38.16	38.27	38.22	37.70	37.51	37.69	37.65	37.55
rat 1	S-e 20%	37.21	37.53	37.91	37.95	37.91	38.04	38.13	37.86	37.62
rat 2	S-e 20%	37.50	37.97	38.16	38.05	37.76	37.65	37.41	37.23	36.99
rat 6	S-e 20%	38.20	38.68	38.77	38.98	39.19	39.21	38.94	38.33	38.28
rat 11	S-e 20%	37.18	36.99	37.06	37.07	37.04	37.02	37.03	37.02	37.06
rat 14	S-e 20%	38.40	38.63	38.68	38.51	38.22	38.10	37.98	37.70	37.46

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 12 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	E-e 10%	38.15	38.24	38.19	38.03	37.96	38.04	37.85	37.90	38.04
rat 9	E-e 10%	38.38	38.40	38.42	38.32	38.26	38.20	38.22	38.17	37.99
rat 19	E-e 10%	37.39	37.45	37.47	37.49	37.52	37.62	37.44	37.26	37.25
rat 16	E-e 10%	37.34	37.33	37.32	37.33	37.30	37.28	37.27	37.31	37.33
rat 3	E-e 10%	36.97	36.99	37.04	37.05	37.03	37.05	37.07	37.05	36.98
rat 6	E-e 10%	36.81	36.77	36.64	36.63	36.59	36.53	36.62	36.62	36.75
rat 9	E-e 10%	36.30	36.26	36.65	36.62	36.63	36.65	36.72	36.71	36.72
rat 15	E-e 10%	37.33	37.27	37.31	37.28	37.24	37.23	37.16	37.19	37.26
rat 2	E-e 10%	36.83	36.85	36.91	36.94	36.93	36.94	36.91	36.88	36.90
rat 7	E-e 10%	37.01	36.71	36.93	37.12	37.29	37.44	37.56	37.64	37.65
rat 14	E-e 10%	37.06	37.14	37.20	37.22	37.32	37.36	37.41	37.28	37.11
rat 12	E-e 20%	37.58	37.55	37.37	37.33	37.33	37.34	37.30	37.26	37.15
rat 13	E-e 20%	37.24	37.30	37.44	37.21	37.24	37.26	37.26	37.14	37.05
rat 15	E-e 20%	37.39	37.41	37.48	37.52	37.41	37.34	37.19	37.13	37.11
rat 16	E-e 20%	37.13	37.21	37.28	37.30	37.37	37.46	37.49	37.52	37.34
rat 17	E-e 20%	37.58	37.57	37.55	37.54	37.53	37.46	37.31	37.32	37.39
rat 14	E-e 20%	36.11	36.38	36.49	36.42	36.76	36.53	36.39	36.44	36.49
rat 12	E-e 20%	37.17	37.21	37.26	37.22	37.15	37.12	37.09	37.12	37.12
rat 13	E-e 20%	36.89	36.91	36.87	36.93	37.01	36.98	36.89	36.89	36.92
rat 16	E-e 20%	38.55	38.46	38.41	38.40	38.40	38.40	38.34	38.33	38.37
rat 15	E-e 20%	36.61	36.68	36.75	36.81	36.86	36.90	36.95	36.98	36.80
rat 1	E-e 5%	36.65	36.66	36.69	36.76	36.82	36.84	36.74	36.85	36.94
rat 11	E-e 5%	37.19	37.19	37.33	37.26	37.20	37.21	37.13	37.22	37.27
rat 4	E-e 5%	38.65	38.58	38.50	38.52	38.71	38.80	38.84	38.88	38.82
rat 5	E-e 5%	36.35	36.20	36.36	36.44	36.09	35.82	35.88	35.97	36.09
rat 13	E-e 5%	37.32	37.33	37.33	37.39	37.46	37.50	37.51	37.55	37.51
rat 7	E-e 5%	36.99	37.04	36.78	36.72	36.78	36.82	36.86	36.86	36.79
rat 18	E-e 5%	36.76	36.70	36.68	36.71	36.75	36.79	36.98	36.94	36.83
rat 8	E-e 5%	38.89	38.91	38.92	39.01	38.89	38.76	38.60	38.57	38.65
rat 3	E-e 5%	36.86	36.79	36.69	36.61	36.50	36.50	36.61	36.76	36.85
rat 11	E-e 5%	36.44	36.30	36.40	36.59	36.58	36.56	36.51	36.62	36.68
rat 9	E-e 5%	36.54	36.62	36.63	36.74	36.85	36.89	36.87	36.93	37.07

Chapter 2, Experiment 1D
Temperatures (Celsius), Training Phase Day 12 (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 3	S-s	37.91	37.95	38.48	38.14	38.04	38.11	37.89	37.94	37.96
rat 4	S-s	37.27	37.24	37.24	37.30	37.34	37.18	37.20	37.19	37.16
rat 5	S-s	38.14	37.87	37.72	37.65	37.62	37.59	37.58	37.51	37.54
rat 8	S-s	36.94	36.86	36.76	36.80	36.84	36.91	37.00	36.86	36.80
rat 17	S-s	37.14	37.02	36.95	36.93	36.99	37.06	37.08	37.13	37.09
rat 20	S-s	37.09	37.07	37.08	37.03	37.17	37.44	37.11	37.13	37.28
rat 1	S-s	37.37	37.10	37.05	37.09	37.21	37.40	37.31	37.24	37.23
rat 2	S-s	37.84	37.79	37.75	37.67	37.61	37.49	37.41	37.37	37.38
rat 4	S-s	38.37	38.13	38.06	37.81	37.86	37.89	37.79	37.70	37.64
rat 6	S-s	37.54	37.43	37.37	37.06	36.96	37.00	37.04	37.16	37.33
rat 8	S-s	37.15	37.05	37.35	37.80	37.40	37.32	37.21	37.29	37.29
rat 10	S-s	36.84	36.85	36.83	36.71	36.62	36.65	36.70	36.78	36.77
rat 12	S-s	37.13	37.14	37.12	37.05	36.79	36.71	36.73	36.72	36.59
rat 4	E-s	37.16	37.05	36.97	36.92	36.99	36.96	36.96	36.95	36.96
rat 7	E-s	37.14	36.89	36.85	36.86	36.95	36.90	36.97	36.98	37.00
rat 8	E-s	37.84	37.98	38.12	38.19	38.24	38.20	38.09	38.04	37.77
rat 14	E-s	36.98	36.96	37.00	36.96	36.93	36.98	37.03	37.05	36.93
rat 3	E-s	35.25	35.40	35.08	35.00	35.43	35.92	35.91	35.94	36.02
rat 8	E-s	37.01	37.05	37.08	37.08	37.15	37.13	37.16	37.18	37.19
rat 10	E-s	36.48	36.49	36.28	35.96	36.23	36.45	36.57	36.61	36.61
rat 12	E-s	37.65	37.63	37.74	37.83	37.79	37.77	37.70	37.66	37.66
rat 13	E-s	37.38	37.39	37.33	37.30	37.32	37.32	37.31	37.30	37.32
rat 1	S-e 5%	37.45	37.28	37.27	37.30	37.22	37.14	37.16	37.19	37.09
rat 2	S-e 5%	37.97	37.65	37.51	37.44	37.37	37.31	37.09	37.07	37.07
rat 3	S-e 5%	37.21	37.13	36.98	36.90	36.89	36.99	37.08	37.01	36.87
rat 11	S-e 5%	37.94	38.07	38.07	37.77	37.33	37.35	37.42	37.50	37.48
rat 4	S-e 5%	37.43	37.39	37.39	37.29	37.18	37.14	37.07	36.99	37.05
rat 5	S-e 5%	37.25	37.19	37.18	37.09	36.98	37.01	37.07	37.04	37.07
rat 7	S-e 5%	37.54	37.38	37.25	37.24	37.34	37.26	37.23	37.26	37.26
rat 9	S-e 5%	37.58	37.53	37.31	37.05	36.97	36.96	36.98	36.99	36.92
rat 15	S-e 5%	37.60	37.53	37.46	37.39	37.23	37.17	37.24	37.29	37.30
rat 5	S-e 20%	37.29	37.16	37.06	37.06	37.10	37.08	37.16	37.21	37.15
rat 9	S-e 20%	37.69	37.59	37.58	37.59	37.37	37.27	37.38	37.40	37.29
rat 10	S-e 20%	37.66	37.49	37.33	37.26	37.13	37.04	36.99	36.98	36.95
rat 15	S-e 20%	37.45	37.69	37.76	37.75	37.44	37.31	37.41	37.37	37.38
rat 1	S-e 20%	37.41	37.17	36.83	36.85	36.90	36.87	36.99	36.96	37.00
rat 2	S-e 20%	36.86	36.78	36.82	36.83	36.87	36.86	36.84	36.70	36.67
rat 6	S-e 20%	38.38	38.37	38.10	37.91	37.80	37.59	37.50	37.47	37.50
rat 11	S-e 20%	37.19	37.03	37.01	36.92	36.76	36.75	36.75	36.72	36.80
rat 14	S-e 20%	37.35	37.32	37.25	37.11	37.08	37.14	37.13	37.07	37.01

Chapter 2, Experiment 1D
Temperatures (Celsius), Test Phase

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	E-e 10%	39.02	39.41	39.41	39.43	39.35	39.09	38.96	39.09	39.19
rat 9	E-e 10%	40.28	40.08	39.80	39.64	39.51	39.34	39.01	38.77	38.78
rat 19	E-e 10%	38.00	38.13	38.04	37.89	37.87	37.84	37.87	37.75	37.68
rat 16	E-e 10%	38.29	38.75	38.89	38.89	38.84	38.59	38.46	38.37	38.35
rat 3	E-e 10%	38.70	38.73	38.74	38.79	38.74	38.60	38.51	38.49	38.54
rat 6	E-e 10%	38.82	38.80	38.71	38.60	38.60	38.59	38.57	38.42	38.19
rat 9	E-e 10%	38.24	38.40	38.33	38.37	38.34	38.29	38.16	38.02	37.97
rat 15	E-e 10%	39.37	39.31	39.15	39.12	38.99	38.89	38.68	38.55	38.67
rat 2	E-e 10%	38.92	38.85	38.83	38.76	38.81	38.73	38.55	38.40	38.29
rat 7	E-e 10%	38.88	38.99	38.92	38.90	38.93	38.69	38.77	38.84	38.61
rat 14	E-e 10%	38.34	38.35	38.07	38.14	38.10	37.96	37.64	37.70	37.78
rat 12	E-e 20%	38.64	38.51	38.49	38.40	38.16	38.09	38.08	37.94	37.69
rat 13	E-e 20%	39.01	38.80	38.64	38.46	38.34	38.22	38.05	37.89	37.91
rat 15	E-e 20%	37.96	38.30	38.42	38.28	38.09	37.94	37.98	37.92	37.82
rat 16	E-e 20%	38.61	38.72	38.75	38.73	38.62	38.45	38.30	38.18	38.04
rat 17	E-e 20%	38.85	38.87	38.74	38.69	38.60	38.43	38.29	38.05	38.05
rat 14	E-e 20%	38.22	38.32	38.24	38.38	38.16	38.26	38.31	38.23	38.10
rat 12	E-e 20%	37.60	37.78	37.87	37.99	38.08	38.22	38.16	38.13	38.13
rat 13	E-e 20%	37.66	37.85	37.96	38.07	38.19	38.34	38.37	38.40	38.19
rat 16	E-e 20%	40.21	40.24	40.04	39.94	39.86	39.55	39.33	39.16	39.00
rat 15	E-e 20%	39.00	38.90	38.68	38.52	38.42	38.48	38.37	38.37	38.22
rat 8	E-e 20%	38.20	38.66	38.77	38.55	38.45	38.51	38.35	37.97	37.75
rat 1	E-e 5%	38.02	38.47	38.72	38.72	38.65	38.62	38.55	38.39	38.38
rat 11	E-e 5%	39.93	40.24	40.25	40.13	39.94	39.78	39.63	39.23	39.22
rat 4	E-e 5%	38.29	38.31	38.20	38.21	38.36	38.32	38.03	37.89	37.97
rat 5	E-e 5%	38.40	38.46	38.48	38.43	38.34	38.26	38.18	38.11	37.98
rat 13	E-e 5%	40.59	40.91	40.84	40.68	40.71	40.63	40.41	40.19	40.54
rat 7	E-e 5%	38.10	38.10	38.06	38.14	38.08	38.05	37.94	37.87	37.80
rat 18	E-e 5%	38.55	38.60	38.51	38.43	38.24	38.21	38.13	38.09	38.16
rat 8	E-e 5%	38.88	38.84	38.76	38.58	38.50	38.74	38.71	38.77	38.61
rat 3	E-e 5%	38.55	38.77	38.80	38.67	38.55	38.60	38.54	38.50	38.42
rat 11	E-e 5%	37.81	38.05	38.23	38.13	38.02	38.15	37.79	37.82	37.94
rat 9	E-e 5%	37.83	38.06	38.13	38.13	37.86	37.72	37.65	37.62	37.67

Chapter 2, Experiment 1D
Temperatures (Celsius), Test Phase (Cont.)

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 3	S-s	39.17	39.11	38.92	38.71	38.35	38.57	38.67	38.69	38.66
rat 4	S-s	38.29	38.42	38.35	38.27	38.32	38.18	37.99	37.82	37.61
rat 5	S-s	38.74	38.72	38.44	38.35	38.30	38.17	38.21	38.02	37.89
rat 8	S-s	38.55	38.37	38.06	37.89	37.79	37.56	37.37	37.46	37.31
rat 17	S-s	38.26	38.33	38.37	38.24	38.13	38.22	38.11	37.70	37.72
rat 20	S-s	37.76	37.99	37.91	37.61	37.53	37.56	37.60	37.32	37.34
rat 1	S-s	38.02	38.43	38.46	38.17	37.87	37.58	37.46	37.45	37.48
rat 2	S-s	38.55	38.57	38.40	38.32	38.19	38.18	38.19	38.24	38.17
rat 4	S-s	38.94	38.83	38.61	38.40	38.28	38.23	38.24	37.97	38.12
rat 6	S-s	37.86	38.07	38.09	38.00	37.76	37.34	37.37	37.24	37.16
rat 8	S-s	37.80	38.05	38.16	38.07	38.09	38.02	37.71	37.51	37.38
rat 10	S-s	37.66	37.65	37.68	37.62	37.60	37.55	37.58	37.53	37.36
rat 12	S-s	38.71	38.72	38.29	38.26	38.05	38.21	38.10	37.78	37.80
rat 4	E-s	37.85	38.02	38.01	38.01	37.89	37.84	37.63	37.49	37.43
rat 7	E-s	37.97	38.42	38.54	38.56	38.54	38.39	38.35	38.18	38.04
rat 8	E-s	39.40	39.63	39.22	39.30	39.06	38.90	38.70	38.36	38.30
rat 14	E-s	37.73	37.98	37.95	37.94	37.93	37.76	37.60	37.74	37.50
rat 3	E-s	38.33	38.58	38.55	38.32	38.21	38.09	38.13	38.23	38.35
rat 8	E-s	38.03	38.30	38.40	38.23	38.02	37.82	37.88	37.95	37.83
rat 10	E-s	38.48	38.55	38.38	38.41	38.49	38.60	38.62	38.68	38.53
rat 12	E-s	38.30	38.54	38.60	38.48	38.11	37.96	37.80	37.66	37.64
rat 13	E-s	38.52	38.77	38.58	38.70	38.75	38.63	38.47	38.49	38.27
rat 1	S-e 5%	38.12	38.53	38.49	38.29	38.23	37.99	37.75	37.54	37.46
rat 2	S-e 5%	39.02	39.02	38.80	38.61	38.06	37.87	37.75	37.79	38.26
rat 3	S-e 5%	37.54	37.94	37.90	38.03	38.09	38.14	38.14	37.77	37.53
rat 11	S-e 5%	38.25	38.14	38.29	38.30	38.32	37.87	37.68	37.86	37.89
rat 4	S-e 5%	38.25	38.46	38.47	38.19	37.94	37.89	37.63	37.46	37.42
rat 5	S-e 5%	38.11	38.41	38.56	38.50	38.49	38.36	38.31	38.37	38.16
rat 7	S-e 5%	37.38	37.62	37.65	37.48	37.42	37.41	37.36	37.24	37.17
rat 9	S-e 5%	37.99	38.32	38.18	37.95	37.67	37.43	37.27	37.15	37.07
rat 15	S-e 5%	38.10	38.34	38.30	38.08	37.98	37.72	37.62	37.84	37.71
rat 5	S-e 20%	38.09	38.15	38.20	38.09	38.06	37.80	37.68	37.80	37.86
rat 9	S-e 20%	37.99	38.31	38.25	38.24	37.83	37.47	37.20	37.14	37.17
rat 10	S-e 20%	37.83	38.30	38.08	37.93	37.85	37.45	37.27	37.32	37.32
rat 15	S-e 20%	38.25	38.16	38.27	38.24	38.21	38.19	37.62	37.26	37.31
rat 1	S-e 20%	38.62	38.89	38.93	38.91	38.35	38.20	38.15	38.21	37.81
rat 2	S-e 20%	37.18	37.36	37.40	37.77	37.81	37.58	37.60	36.89	36.63
rat 6	S-e 20%	37.78	38.01	38.23	38.45	38.41	38.30	38.06	37.85	37.67
rat 11	S-e 20%	38.19	38.36	38.30	38.11	38.06	37.75	37.55	37.42	37.41
rat 14	S-e 20%	38.72	38.66	38.48	38.26	37.89	37.89	37.44	37.26	37.02

Chapter 2, Experiment 1D
Temperatures (Celsius), Test Phase (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	E-e 10%	39.16	39.18	38.88	38.77	38.78	38.61	38.67	38.56	38.55
rat 9	E-e 10%	38.63	38.44	38.30	38.21	38.41	38.56	38.68	38.76	38.88
rat 19	E-e 10%	37.68	37.73	37.55	37.44	37.52	37.43	37.51	37.53	37.50
rat 16	E-e 10%	38.31	38.21	38.16	38.01	37.59	37.51	37.46	37.61	37.70
rat 3	E-e 10%	38.40	38.36	38.36	38.26	37.84	37.63	37.52	37.48	37.44
rat 6	E-e 10%	37.96	37.89	37.89	37.76	37.70	37.63	37.56	37.50	37.47
rat 9	E-e 10%	37.80	37.78	37.52	37.43	37.43	37.43	37.43	37.37	37.37
rat 15	E-e 10%	38.71	38.59	38.50	38.51	38.19	38.05	37.94	37.93	37.63
rat 2	E-e 10%	38.16	38.05	37.91	37.89	37.89	37.90	37.73	37.61	37.58
rat 7	E-e 10%	38.40	38.57	38.51	38.54	38.47	38.43	38.39	38.37	38.41
rat 14	E-e 10%	37.72	37.52	37.44	37.40	37.25	37.26	37.24	37.33	37.35
rat 12	E-e 20%	37.65	37.57	37.53	37.50	37.35	37.28	37.26	37.33	37.32
rat 13	E-e 20%	37.89	37.68	37.58	37.56	37.40	37.40	37.26	37.34	37.42
rat 15	E-e 20%	37.79	37.79	37.77	37.79	37.73	37.65	37.57	37.55	37.53
rat 16	E-e 20%	37.95	37.93	37.80	37.64	37.49	37.47	37.46	37.43	37.41
rat 17	E-e 20%	37.94	37.84	37.81	37.83	37.87	37.74	37.65	37.57	37.54
rat 14	E-e 20%	38.08	38.04	37.88	37.88	37.86	37.82	37.79	37.73	37.66
rat 12	E-e 20%	38.06	37.95	37.82	37.76	37.86	37.77	37.74	37.59	37.51
rat 13	E-e 20%	37.97	37.91	37.98	37.88	37.81	37.71	37.63	37.58	37.60
rat 16	E-e 20%	38.85	38.80	38.74	38.67	38.66	38.68	38.63	38.56	38.61
rat 15	E-e 20%	37.77	38.01	37.94	37.90	37.83	37.76	37.79	37.75	37.64
rat 8	E-e 20%	37.83	37.77	38.06	38.35	38.34	38.01	37.68	37.60	37.58
rat 1	E-e 5%	38.32	38.15	38.11	37.95	37.49	37.45	37.40	37.43	37.25
rat 11	E-e 5%	39.17	39.25	39.07	39.08	39.17	39.27	39.26	39.20	39.06
rat 4	E-e 5%	37.79	37.97	37.85	37.66	37.66	37.70	37.73	37.97	37.75
rat 5	E-e 5%	38.02	37.94	37.75	37.72	37.58	37.51	37.47	37.43	37.36
rat 13	E-e 5%	40.24	40.33	40.31	40.29	39.94	39.58	39.67	39.58	39.41
rat 7	E-e 5%	37.77	37.72	37.67	37.67	37.65	37.59	37.59	37.55	37.47
rat 18	E-e 5%	38.05	37.92	38.17	37.97	37.90	37.83	37.69	37.50	37.42
rat 8	E-e 5%	38.29	38.08	37.92	37.94	37.86	37.58	37.41	37.29	37.27
rat 3	E-e 5%	38.37	38.48	38.20	38.20	38.21	38.18	37.90	37.75	37.61
rat 11	E-e 5%	37.72	37.59	37.38	37.29	36.93	36.90	36.97	36.97	36.99
rat 9	E-e 5%	37.74	37.68	37.49	37.33	37.39	37.37	37.33	37.30	37.28

Chapter 2, Experiment 1D
Temperatures (Celsius), Test Phase (Cont.)

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 3	S-s	38.57	38.68	38.78	38.78	38.77	38.68	38.68	38.50	38.42
rat 4	S-s	37.61	37.65	37.54	37.44	37.46	37.43	37.39	37.46	37.40
rat 5	S-s	37.75	37.68	37.74	37.57	37.64	37.62	37.49	37.47	37.37
rat 8	S-s	37.08	36.98	36.97	37.09	37.16	37.22	36.98	36.98	37.00
rat 17	S-s	37.48	37.38	37.46	37.48	37.52	37.20	37.04	37.00	36.96
rat 20	S-s	37.35	37.31	37.30	37.33	37.31	37.28	37.24	37.20	37.20
rat 1	S-s	37.49	37.48	37.50	37.54	37.45	37.43	37.36	37.32	37.33
rat 2	S-s	37.95	37.96	37.73	37.69	37.66	37.74	37.67	37.56	37.52
rat 4	S-s	38.00	37.65	37.52	37.52	37.55	37.47	37.43	37.40	37.45
rat 6	S-s	37.23	37.39	37.29	37.23	37.25	37.25	37.25	37.25	37.26
rat 8	S-s	37.33	37.26	37.15	37.27	37.34	36.97	36.96	36.97	36.98
rat 10	S-s	37.32	37.39	37.16	37.10	37.13	36.92	36.85	36.92	36.92
rat 12	S-s	37.87	37.69	37.38	37.19	37.12	37.17	37.21	37.21	36.99
rat 4	E-s	37.36	37.29	37.27	37.25	37.25	37.18	37.11	37.08	37.08
rat 7	E-s	37.93	37.56	37.50	37.51	37.28	37.50	37.61	37.36	37.37
rat 8	E-s	38.39	38.46	38.42	38.31	38.19	38.20	38.26	38.30	38.30
rat 14	E-s	37.35	37.35	37.42	37.48	37.45	37.26	37.14	37.26	37.32
rat 3	E-s	38.46	38.51	38.58	38.61	38.41	38.29	38.05	37.67	37.72
rat 8	E-s	37.73	37.54	37.50	37.48	37.43	37.39	37.37	37.36	37.34
rat 10	E-s	38.47	38.45	38.33	38.51	38.76	38.61	38.33	37.90	37.62
rat 12	E-s	37.65	37.70	37.64	37.64	37.59	37.64	37.54	37.41	37.45
rat 13	E-s	37.88	37.84	37.70	37.62	37.61	37.51	37.38	37.37	37.37
rat 1	S-e 5%	37.27	37.26	37.20	37.14	37.14	37.02	37.04	37.05	37.04
rat 2	S-e 5%	38.29	38.37	38.41	38.20	38.26	38.27	37.76	37.63	37.57
rat 3	S-e 5%	37.31	37.18	37.06	37.00	36.85	36.93	37.05	37.07	37.08
rat 11	S-e 5%	37.52	37.41	37.22	37.08	37.27	37.50	37.73	37.73	37.68
rat 4	S-e 5%	37.44	37.28	37.14	37.14	37.17	37.20	37.20	37.22	37.19
rat 5	S-e 5%	38.06	38.08	38.24	38.13	38.05	37.92	37.69	37.63	37.56
rat 7	S-e 5%	37.09	37.01	36.95	36.88	36.91	36.95	36.93	36.91	36.91
rat 9	S-e 5%	37.15	37.12	36.96	36.93	36.90	36.86	36.82	36.79	36.75
rat 15	S-e 5%	37.74	37.84	37.73	37.70	37.69	37.68	37.64	37.40	37.26
rat 5	S-e 20%	37.60	37.57	37.52	37.47	37.47	37.23	37.03	37.00	37.10
rat 9	S-e 20%	37.21	37.28	37.28	37.29	37.13	36.95	36.81	36.82	36.89
rat 10	S-e 20%	37.23	37.05	36.91	36.91	36.82	36.77	36.76	36.74	36.71
rat 15	S-e 20%	37.17	37.14	37.09	37.01	37.00	37.01	36.96	36.94	36.89
rat 1	S-e 20%	37.73	37.80	37.72	37.46	37.45	37.44	37.39	37.30	37.17
rat 2	S-e 20%	36.59	36.55	36.42	36.44	36.64	36.75	36.67	36.71	36.76
rat 6	S-e 20%	37.50	37.38	37.26	37.11	37.03	37.06	36.99	36.97	36.89
rat 11	S-e 20%	37.31	37.32	37.30	37.26	37.03	36.91	36.93	36.92	36.89
rat 14	S-e 20%	37.02	37.06	37.03	37.10	37.09	37.14	37.16	37.17	37.15

Chapter 2, Experiment 1D
Temperature Difference Scores (Test Phase Temperature Minus Baseline Day 4 Temperature)

Subject	Group	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	45 min
rat 1	E-e 10%	-0.02	-0.09	-0.14	0.15	0.17	-0.15	-0.33	0.01	0.28
rat 9	E-e 10%	0.99	0.68	0.69	0.71	0.92	0.68	0.40	0.22	0.35
rat 19	E-e 10%	-0.66	-0.57	-0.45	-0.65	-0.37	-0.12	0.26	0.27	0.24
rat 16	E-e 10%	0.21	0.76	1.26	1.41	1.32	0.88	0.72	0.68	0.81
rat 3	E-e 10%	0.30	0.29	0.34	0.39	0.36	0.44	0.40	0.30	0.32
rat 6	E-e 10%	1.09	0.82	0.78	0.69	0.82	1.04	1.10	1.04	0.79
rat 9	E-e 10%	0.54	0.40	0.51	0.55	0.72	0.80	0.64	0.56	0.50
rat 15	E-e 10%	0.41	0.41	0.46	0.72	1.09	1.24	1.12	1.15	1.42
rat 2	E-e 10%	0.59	0.58	0.77	0.84	0.92	1.03	0.93	0.87	0.88
rat 7	E-e 10%	1.38	1.47	1.47	1.47	1.59	1.43	1.52	1.66	1.39
rat 14	E-e 10%	0.98	0.77	0.31	0.38	0.40	0.35	0.13	0.30	0.42
rat 12	E-e 20%	-0.02	-0.03	0.36	0.38	0.26	0.29	0.36	0.31	0.14
rat 13	E-e 20%	0.25	0.15	0.45	0.44	0.38	0.52	0.51	0.30	0.43
rat 15	E-e 20%	-0.46	-0.19	-0.05	-0.22	-0.36	0.03	0.30	0.23	0.06
rat 16	E-e 20%	0.00	0.17	0.51	0.57	0.58	0.27	-0.01	-0.20	0.06
rat 17	E-e 20%	-0.19	-0.13	0.06	0.41	0.67	0.66	0.61	0.44	0.52
rat 14	E-e 20%	0.23	0.38	0.39	0.61	0.47	0.45	0.64	0.70	0.56
rat 12	E-e 20%	-0.50	0.08	0.13	0.20	0.26	0.40	0.37	0.37	0.36
rat 13	E-e 20%	-0.12	-0.23	0.28	0.50	0.80	1.06	1.20	1.41	1.00
rat 16	E-e 20%	0.24	0.23	0.00	0.02	0.15	-0.06	-0.11	-0.16	-0.25
rat 15	E-e 20%	1.25	1.11	0.99	0.72	0.66	0.87	0.84	0.97	0.80
rat 12	E-e20%	0.35	0.60	0.82	0.82	0.61	0.71	0.60	0.26	0.21
rat 1	E-e 5%	-0.27	0.13	0.59	0.64	0.60	0.62	0.73	0.68	0.75
rat 11	E-e 5%	-1.03	-1.17	-1.19	-1.07	-0.84	-0.85	-0.84	-0.74	-0.55
rat 4	E-e 5%	0.07	-0.04	0.30	0.45	0.60	0.75	0.86	0.85	0.78
rat 5	E-e 5%	0.23	0.00	-0.02	0.04	0.14	0.38	0.36	0.37	0.35
rat 13	E-e 5%	0.04	-0.31	-0.37	-0.07	0.08	0.43	0.46	0.47	0.12
rat 7	E-e 5%	2.71	2.75	2.84	2.84	2.70	2.53	2.37	1.92	1.86
rat 18	E-e 5%	2.72	2.92	3.07	2.97	3.00	2.96	2.75	2.48	2.87
rat 8	E-e 5%	0.02	-0.06	0.18	-0.01	0.06	0.17	0.08	0.14	0.42
rat 3	E-e 5%	0.35	0.57	0.94	1.04	0.95	1.00	0.58	0.78	0.89
rat 11	E-e 5%	0.38	0.40	0.49	0.48	0.43	0.32	0.13	0.17	0.15
rat 9	E-e 5%	0.47	0.28	0.06	-0.09	-0.45	-0.41	-0.41	-0.19	-0.22

Chapter 2, Experiment 1D
Temperature Difference Scores (Test Phase Temperature Minus Baseline Day 4 Temperature)Cont.

Subject	Group									
rat 3	S-s	0.04	-0.16	0.06	-0.12	-0.58	-0.20	0.02	0.06	0.09
rat 4	S-s	0.17	0.07	0.11	0.31	0.57	0.51	0.58	0.51	0.24
rat 5	S-s	0.98	0.55	0.06	0.02	0.13	0.04	0.18	0.08	0.19
rat 8	S-s	0.09	0.17	-0.06	-0.23	-0.11	-0.20	-0.26	-0.14	-0.26
rat 17	S-s	0.58	0.30	0.31	0.28	0.22	0.38	0.34	-0.10	-0.02
rat 20	S-s	0.15	0.22	0.11	-0.17	-0.14	-0.03	0.05	-0.14	-0.04
rat 1	S-s	0.16	0.14	0.20	0.35	0.49	0.46	0.59	0.64	0.49
rat 2	S-s	-0.39	0.00	0.09	-0.05	-0.30	-0.47	-0.50	-0.46	-0.41
rat 4	S-s	0.33	0.32	0.15	-0.02	-0.15	-0.22	-0.32	-0.30	-0.29
rat 4	E-s	-0.33	-0.38	-0.36	-0.31	-0.26	0.03	-0.06	-0.11	-0.16
rat 7	E-s	-0.62	-0.34	-0.16	-0.07	0.08	0.01	0.04	0.16	0.48
rat 8	E-s	1.14	1.06	0.72	0.95	0.72	0.67	0.36	0.07	0.07
rat 14	E-s	0.05	0.13	0.19	0.36	0.48	0.36	0.19	0.31	0.06
rat 3	E-s	1.57	1.39	1.00	0.76	0.88	1.06	1.17	1.21	1.37
rat 8	E-s	0.56	0.47	0.15	0.16	0.19	0.12	0.27	0.39	0.61
rat 10	E-s	0.10	-0.19	-0.12	-0.19	-0.18	-0.14	0.10	0.32	0.29
rat 12	E-s	0.77	0.40	0.01	0.05	0.26	0.40	0.76	1.14	1.04
rat 13	E-s	-0.37	-0.39	-0.44	-0.60	-0.88	-0.79	-0.74	-0.74	-0.51
rat 1	S-e 5%	0.51	0.52	0.38	0.36	-0.10	-0.10	-0.31	-0.23	0.39
rat 2	S-e 5%	-0.83	-0.51	-0.48	-0.05	0.26	0.32	0.56	0.07	-0.22
rat 3	S-e 5%	-0.36	-0.43	0.08	0.56	0.81	0.56	0.46	0.69	0.74
rat 11	S-e 5%	-0.51	-0.44	-0.32	-0.45	-0.59	-0.54	-0.64	-0.73	-0.68
rat 4	S-e 5%	0.37	0.23	0.16	-0.05	0.19	0.19	0.22	0.40	0.33
rat 5	S-e 5%	-0.19	-0.34	-0.60	-0.79	-0.76	-0.67	-0.52	-0.52	-0.44
rat 7	S-e 5%	-0.47	-0.40	-0.51	-0.64	-0.88	-1.05	-0.97	-0.86	-0.63
rat 9	S-e 5%	0.02	0.17	0.26	0.24	0.40	0.26	0.20	0.56	0.51
rat 5	S-e 20%	0.98	0.67	0.65	0.52	0.53	0.46	0.33	0.34	0.50
rat 9	S-e 20%	-0.17	0.08	0.19	0.02	-0.45	-0.74	-0.82	-0.80	-0.71
rat 10	S-e 20%	-0.84	-0.50	-0.51	-0.45	-0.68	-0.87	-0.92	-0.82	-0.73
rat 15	S-e 20%	0.43	0.09	0.30	0.39	0.46	0.39	0.03	-0.11	0.06
rat 1	S-e 20%	-0.17	-0.01	0.10	0.45	-0.01	-0.08	-0.16	0.07	-0.09
rat 2	S-e 20%	-1.01	-1.26	-1.36	-1.02	-0.86	-0.94	-0.87	-1.51	-1.71
rat 6	S-e 20%	-0.30	-0.28	0.09	0.37	0.18	0.19	0.19	-0.04	-0.18
rat 11	S-e 20%	-0.50	-0.48	-0.43	-0.45	-0.31	-0.56	-1.01	-1.24	-1.04
rat 14	S-e 20%	0.20	0.25	0.31	0.16	-0.19	0.02	-0.09	-0.10	-0.30

Chapter 2, Experiment 1D
Temperature Difference Scores (Test Phase Temperature Minus Baseline Day 4 Temperature)Cont.

Subject	Group	50 min	55 min	60 min	65 min	70 min	75 min	80 min	85 min	90 min
rat 1	E-e 10%	0.42	0.55	0.36	0.29	0.23	0.16	0.27	0.17	0.15
rat 9	E-e 10%	0.30	0.18	0.05	-0.02	0.29	0.64	0.82	0.85	0.95
rat 19	E-e 10%	0.29	0.05	-0.06	-0.09	0.06	-0.01	0.07	-0.03	-0.03
rat 16	E-e 10%	0.86	0.79	0.77	0.59	0.16	0.10	0.04	0.15	0.18
rat 3	E-e 10%	0.27	0.50	0.66	0.71	0.44	0.29	0.22	0.17	0.25
rat 6	E-e 10%	0.65	0.63	0.62	0.52	0.50	0.49	0.47	0.42	0.42
rat 9	E-e 10%	0.37	0.36	0.18	0.20	0.28	0.38	0.39	0.34	0.35
rat 15	E-e 10%	1.40	1.30	1.19	1.21	0.93	0.81	0.70	0.67	0.34
rat 2	E-e 10%	0.87	0.83	0.76	0.79	0.80	0.84	0.71	0.61	0.59
rat 7	E-e 10%	1.23	1.53	1.69	1.69	1.56	1.48	1.47	1.64	1.69
rat 14	E-e 10%	0.43	0.30	0.25	0.25	0.06	0.14	0.17	0.25	0.25
rat 12	E-e 20%	0.14	0.07	0.05	0.08	-0.05	-0.13	-0.16	-0.10	-0.05
rat 13	E-e 20%	0.48	0.24	0.16	0.26	0.06	0.07	-0.05	0.00	0.05
rat 15	E-e 20%	-0.02	0.00	-0.04	-0.09	-0.16	-0.17	-0.16	-0.22	-0.14
rat 16	E-e 20%	0.11	0.12	-0.08	-0.30	-0.47	-0.50	-0.47	-0.49	-0.60
rat 17	E-e 20%	0.43	0.36	0.30	0.36	0.41	0.31	0.12	0.02	0.00
rat 14	E-e 20%	0.71	0.84	0.75	0.72	0.68	0.70	0.68	0.53	0.44
rat 12	E-e 20%	0.30	0.22	0.03	0.09	0.36	0.30	0.29	0.18	0.15
rat 13	E-e 20%	0.72	0.73	0.85	0.75	0.67	0.60	0.45	0.60	0.53
rat 16	E-e 20%	-0.34	-0.27	-0.30	-0.32	-0.31	-0.28	-0.36	-0.44	-0.27
rat 15	E-e 20%	0.34	0.59	0.58	0.53	0.49	0.47	0.66	0.71	0.64
rat 12	E-e 20%	0.37	0.38	0.77	1.13	1.18	0.94	0.82	0.79	0.76
rat 1	E-e 5%	0.82	0.75	0.74	0.67	0.25	0.25	0.28	0.38	0.24
rat 11	E-e 5%	-0.60	-0.31	-0.43	-0.59	-0.53	-0.46	-0.35	-0.08	-0.34
rat 4	E-e 5%	0.86	0.82	0.69	0.70	0.51	0.42	0.44	0.56	0.59
rat 5	E-e 5%	0.37	0.43	0.41	0.47	0.38	0.42	0.49	0.44	0.36
rat 13	E-e 5%	-0.18	-0.22	-0.29	-0.30	-0.41	-0.57	-0.75	-0.91	-1.00
rat 7	E-e 5%	1.80	1.85	1.65	1.64	1.73	1.80	1.92	1.93	1.78
rat 18	E-e 5%	2.64	2.70	2.90	3.00	2.66	2.35	2.43	2.45	2.08
rat 8	E-e 5%	0.38	0.32	0.59	0.41	0.34	0.23	0.18	0.16	0.25
rat 3	E-e 5%	0.64	0.49	0.26	0.23	-0.14	-0.22	-0.26	-0.28	-0.14
rat 11	E-e 5%	0.30	0.65	0.44	0.50	0.60	0.59	0.25	0.22	0.17
rat 9	E-e 5%	0.06	0.24	0.22	0.19	0.40	0.46	0.53	0.74	0.69

Chapter 2, Experiment 1D
Temperature Difference Scores (Test Phase Temperature Minus Baseline Day 4 Temperature)Cont.

Subject	Group									
rat 3	S-s	0.02	0.33	0.35	0.56	0.63	0.63	0.69	0.60	0.60
rat 4	S-s	0.18	0.18	0.07	0.07	0.18	0.20	0.17	0.19	-0.05
rat 5	S-s	0.09	0.10	0.19	0.15	0.28	0.33	0.23	0.21	0.18
rat 8	S-s	-0.42	-0.53	-0.53	-0.35	-0.31	-0.24	-0.46	-0.41	-0.43
rat 17	S-s	-0.15	-0.20	-0.06	0.07	0.05	-0.40	-0.84	-1.06	-1.25
rat 20	S-s	-0.03	-0.09	-0.07	-0.04	-0.10	-0.17	-0.22	-0.23	-0.11
rat 1	S-s	0.41	0.49	0.30	0.34	0.44	0.28	0.24	0.28	0.29
rat 2	S-s	-0.23	-0.10	0.02	0.15	0.12	0.18	0.14	0.09	0.09
rat 4	S-s	-0.37	-0.26	-0.33	-0.35	-0.38	-0.21	-0.24	-0.25	-0.29
rat 4	E-s	-0.10	-0.12	-0.06	-0.01	-0.10	-0.15	-0.14	-0.07	0.08
rat 7	E-s	0.53	0.18	0.15	0.19	0.03	0.26	0.46	0.16	0.28
rat 8	E-s	0.34	0.56	0.51	0.77	0.79	0.81	0.92	1.01	1.32
rat 14	E-s	-0.06	-0.01	0.05	0.10	0.02	-0.15	-0.11	-0.01	0.02
rat 3	E-s	1.47	1.39	1.46	1.63	1.47	1.40	1.13	0.69	0.72
rat 8	E-s	0.23	0.38	0.22	0.02	0.02	-0.04	-0.08	0.02	0.12
rat 10	E-s	0.28	0.16	0.21	0.27	0.24	0.23	0.22	0.22	0.27
rat 12	E-s	1.00	1.12	1.08	1.29	1.55	1.41	1.20	0.83	0.48
rat 13	E-s	-0.29	-0.11	-0.09	-0.04	-0.01	0.10	-0.01	-0.11	0.01
rat 1	S-e 5%	-0.92	-0.80	-0.85	-0.96	-0.90	-0.64	-0.38	-0.54	-0.68
rat 2	S-e 5%	0.53	0.78	0.84	0.74	0.90	0.98	0.47	0.47	0.50
rat 3	S-e 5%	-0.31	-0.27	-0.28	-0.33	-0.48	-0.47	-0.28	-0.14	-0.06
rat 11	S-e 5%	0.53	0.50	0.36	0.25	0.44	0.70	0.94	0.91	0.69
rat 4	S-e 5%	-0.55	-0.67	-0.65	-0.55	-0.48	-0.43	-0.36	-0.21	-0.22
rat 5	S-e 5%	0.31	0.48	0.95	0.63	0.51	0.51	0.39	0.41	0.32
rat 7	S-e 5%	-0.25	0.00	0.02	-0.07	-0.10	-0.08	-0.15	-0.12	-0.08
rat 9	S-e 5%	-0.48	-0.50	-0.54	-0.46	-0.42	-0.40	-0.30	-0.12	-0.13
rat 15	S-e 5%	0.55	0.65	0.60	0.62	0.70	0.71	0.70	0.41	0.30
rat 5	S-e 20%	0.58	0.62	0.55	0.42	0.41	0.10	-0.14	-0.21	-0.05
rat 9	S-e 20%	-0.37	0.04	0.10	0.14	-0.05	-0.18	-0.32	-0.34	-0.20
rat 10	S-e 20%	-0.69	-0.76	-0.90	-0.96	-1.03	-1.09	-1.07	-1.09	-1.11
rat 15	S-e 20%	-0.07	-0.06	0.04	-0.02	-0.05	-0.01	-0.02	0.02	-0.04
rat 1	S-e 20%	0.07	0.21	0.07	-0.29	-0.31	-0.04	0.00	-0.11	-0.24
rat 2	S-e 20%	-1.38	-1.39	-1.31	-1.07	-0.87	-0.80	-0.88	-0.79	-0.68
rat 6	S-e 20%	-0.28	-0.26	-0.25	-0.25	-0.21	-0.13	-0.17	-0.13	-0.14
rat 11	S-e 20%	-0.99	-1.03	-0.97	-0.88	-1.08	-1.13	-1.07	-1.09	-1.15
rat 14	S-e 20%	-0.26	-0.27	-0.26	-0.15	-0.16	-0.13	-0.12	-0.13	-0.20

APPENDIX E

Raw data collected for experiment 2A presented in Chapter 3

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 1 (3g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	40	43	41	44	43	45
rat 2	ethanol	45	48	45	46	50	44
rat 3	ethanol	44	52	44	44	54	46
rat 4	ethanol	49	45	43	45	41	32
rat 5	ethanol	51	43	46	42	51	50
rat 6	ethanol	42	41	41	42	37	43
rat 9	ethanol	41	43	42	35	45	45
rat 10	ethanol	46	43	49	42	41	41
rat 11	ethanol	49	45	45	49	40	40
rat 14	ethanol	32	46	42	43	40	41
rat 15	ethanol	40	41	44	50	41	40
rat 16	ethanol	41	48	45	53	48	51
rat 17	ethanol	46	43	38	56	42	42
rat 18	ethanol	42	44	43	37	55	48
rat 19	ethanol	42	36	42	39	45	39
rat 20	ethanol	42	45	41	44	40	42
rat 21	ethanol	32	51	41	46	42	44
rat 22	ethanol	40	36	42	46	48	50
rat 23	ethanol	38	54	50	41	41	35
rat 24	ethanol	49	36	45	51	41	47

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 2 (4g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 3	ethanol	49	46	41	47	55	42
rat 4	ethanol	48	42	51	37	36	47
rat 5	ethanol	50	44	45	51	39	45
rat 6	ethanol	37	38	40	46	36	40
rat 9	ethanol	45	51	52	53	36	48
rat 10	ethanol	37	59	57	27	33	36
rat 11	ethanol	36	46	45	39	39	32
rat 14	ethanol	38	41	49	45	42	39
rat 15	ethanol	40	45	44	40	50	43
rat 16	ethanol	45	46	48	39	39	41
rat 17	ethanol	40	48	46	44	49	45
rat 18	ethanol	41	39	46	43	41	41
rat 19	ethanol	42	41	51	41	38	39
rat 20	ethanol	42	41	45	41	36	40
rat 21	ethanol	43	41	43	49	38	45
rat 22	ethanol	40	40	40	47	41	41
rat 23	ethanol	43	47	46	37	47	46
rat 24	ethanol	40	40	42	41	33	43
rat 26	ethanol	46	43	42	44	41	43

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 3 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	37	41	41	38	46	44
rat 2	ethanol	43	42	42	33	32	32
rat 3	ethanol	41	42	45	46	41	40
rat 4	ethanol	51	47	48	35	29	32
rat 5	ethanol	41	39	40	41	32	38
rat 6	ethanol	42	46	44	52	51	45
rat 9	ethanol	54	54	51	30	36	31
rat 10	ethanol	43	44	44	33	33	44
rat 11	ethanol	42	45	44	27	34	33
rat 14	ethanol	42	46	42	38	45	42
rat 15	ethanol	42	35	36	45	44	40
rat 16	ethanol	36	43	46	43	53	45
rat 17	ethanol	45	45	49	47	38	41
rat 18	ethanol	49	49	43	41	42	37
rat 19	ethanol	43	47	47	39	45	41
rat 20	ethanol	39	37	43	45	32	41
rat 23	ethanol	43	52	48	36	37	31
rat 24	ethanol	44	45	43	38	30	40
rat 25	ethanol	43	45	49	30	29	30

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 4 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	39	43	45	51	46	40
rat 2	ethanol	52	51	52	45	38	48
rat 3	ethanol	35	49	44	47	48	42
rat 4	ethanol	42	44	45	45	40	43
rat 5	ethanol	51	47	47	44	42	50
rat 6	ethanol	39	42	49	31	36	48
rat 9	ethanol	46	44	51	41	51	45
rat 10	ethanol	52	54	56	33	32	27
rat 11	ethanol	44	46	47	48	42	45
rat 14	ethanol	46	46	48	48	42	38
rat 15	ethanol	41	46	48	48	46	43
rat 16	ethanol	40	45	49	52	45	48
rat 17	ethanol	55	49	58	31	34	40
rat 18	ethanol	45	47	51	41	48	48
rat 19	ethanol	49	53	49	43	45	41
rat 20	ethanol	48	43	47	53	46	53
rat 21	ethanol	48	41	43	32	36	40
rat 22	ethanol	53	49	52	47	50	44
rat 23	ethanol	49	50	51	33	42	45
rat 24	ethanol	49	47	47	41	37	28
rat 26	ethanol	45	42	47	40	42	31

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 5 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	46	48	49	51	44	33
rat 2	ethanol	46	47	50	41	36	28
rat 3	ethanol	45	48	54	43	49	48
rat 4	ethanol	47	48	45	25	30	29
rat 5	ethanol	48	54	55	38	35	43
rat 6	ethanol	45	54	45	37	41	48
rat 9	ethanol	48	46	49	48	46	35
rat 10	ethanol	52	51	51	31	31	32
rat 11	ethanol	41	48	44	36	36	38
rat 14	ethanol	47	50	50	25	29	33
rat 15	ethanol	45	40	40	50	44	45
rat 16	ethanol	37	44	43	30	39	38
rat 17	ethanol	43	47	43	49	38	38
rat 18	ethanol	51	53	49	42	43	45
rat 19	ethanol	52	49	53	39	43	40
rat 20	ethanol	47	48	48	33	32	34
rat 21	ethanol	37	45	47	44	47	46
rat 22	ethanol	40	39	44	35	32	35
rat 23	ethanol	52	57	50	28	26	29
rat 24	ethanol	52	47	53	39	44	36
rat 25	ethanol	47	45	44	30	25	24
rat 26	ethanol	45	47	48	33	38	47

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 6 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	41	47	49	51	52	51
rat 2	ethanol	50	51	55	50	44	45
rat 3	ethanol	50	51	52	53	57	55
rat 4	ethanol	35	42	46	43	47	46
rat 5	ethanol	46	53	58	50	37	39
rat 6	ethanol	45	43	44	47	50	45
rat 9	ethanol	50	50	45	28	27	25
rat 10	ethanol	57	58	55	30	27	24
rat 11	ethanol	56	45	47	23	25	24
rat 14	ethanol	45	47	48	38	40	43
rat 15	ethanol	47	44	49	51	50	47
rat 16	ethanol	53	56	49	41	41	36
rat 17	ethanol	42	42	46	48	47	52
rat 18	ethanol	44	44	53	50	53	50
rat 19	ethanol	47	38	48	34	30	30
rat 20	ethanol	52	54	57	41	48	47
rat 21	ethanol	45	50	50	42	46	53
rat 22	ethanol	45	47	47	47	39	40
rat 23	ethanol	52	53	51	30	28	24
rat 24	ethanol	40	45	46	49	38	32
rat 25	ethanol	48	40	49	31	29	27
rat 26	ethanol	47	56	53	33	45	27

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 7 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	47	45	45	46	41	33
rat 2	ethanol	45	48	50	46	35	34
rat 3	ethanol	46	52	52	47	52	46
rat 4	ethanol	44	37	47	33	37	24
rat 5	ethanol	44	45	48	44	45	44
rat 6	ethanol	38	49	48	37	53	49
rat 9	ethanol	51	54	50	33	32	27
rat 10	ethanol	54	59	53	27	27	25
rat 11	ethanol	45	50	46	39	41	42
rat 14	ethanol	58	50	50	25	29	25
rat 15	ethanol	44	46	44	40	42	41
rat 16	ethanol	40	40	44	39	36	38
rat 17	ethanol	43	44	40	42	28	31
rat 18	ethanol	54	55	45	50	31	34
rat 19	ethanol	48	49	55	51	51	46
rat 20	ethanol	49	49	50	51	51	36
rat 21	ethanol	46	48	42	50	35	37
rat 22	ethanol	41	52	45	35	27	32
rat 23	ethanol	52	51	48	30	29	26
rat 24	ethanol	42	49	51	50	36	37
rat 25	ethanol	45	48	51	34	27	28
rat 26	ethanol	42	48	50	42	39	26

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 8 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	41	46	47	45	40	39
rat 2	ethanol	49	55	49	31	34	35
rat 3	ethanol	50	51	50	50	46	47
rat 4	ethanol	42	42	50	24	30	32
rat 5	ethanol	53	53	38	42	49	49
rat 6	ethanol	38	41	44	42	31	28
rat 9	ethanol	51	46	49	45	43	43
rat 10	ethanol	56	50	37	28	29	27
rat 11	ethanol	48	40	45	30	31	39
rat 14	ethanol	47	40	47	24	19	26
rat 15	ethanol	46	51	42	43	44	54
rat 16	ethanol	49	50	50	31	32	32
rat 17	ethanol	45	46	49	44	36	38
rat 18	ethanol	45	42	49	36	38	37
rat 19	ethanol	55	54	49	50	43	46
rat 20	ethanol	49	54	52	31	29	28
rat 21	ethanol	46	46	48	24	28	27
rat 22	ethanol	37	43	47	30	25	26
rat 23	ethanol	43	49	52	27	28	24
rat 24	ethanol	49	39	45	33	45	38
rat 25	ethanol	49	51	43	28	29	26
rat 26	ethanol	43	44	44	38	22	23

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 9 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	44	45	44	48	31	39
rat 2	ethanol	46	44	40	38	32	31
rat 3	ethanol	49	50	43	51	49	47
rat 5	ethanol	50	49	50	37	39	32
rat 6	ethanol	41	39	40	29	32	42
rat 9	ethanol	44	47	43	52	45	47
rat 10	ethanol	51	44	47	32	32	32
rat 11	ethanol	52	44	42	33	39	26
rat 14	ethanol	43	47	50	28	29	27
rat 15	ethanol	43	47	48	38	51	49
rat 16	ethanol	46	46	44	47	50	36
rat 18	ethanol	48	49	49	43	46	38
rat 19	ethanol	50	51	53	44	39	33
rat 20	ethanol	49	52	51	40	46	42
rat 21	ethanol	47	46	50	28	34	35
rat 22	ethanol	44			24	26	18
rat 23	ethanol	44	44	47	28	30	30
rat 24	ethanol	52	47	53	37	43	45
rat 25	ethanol	40	46	50	35	32	33
rat 26	ethanol	48	48	46	33	28	21

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 10 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	47	45	40	45	41	39
rat 2	ethanol	46	45	49	34	43	30
rat 3	ethanol	48	43	49	45	50	44
rat 4	ethanol	50	50	48	33	38	33
rat 5	ethanol	48	52	51	45	47	44
rat 6	ethanol	47	46	44	39	41	34
rat 9	ethanol	45	41	45	49	45	42
rat 10	ethanol	37	54	47	31	32	38
rat 11	ethanol	40	50	44	47	44	40
rat 15	ethanol	48	44	44	45	45	49
rat 16	ethanol	45	53	53	50	44	33
rat 17	ethanol	43	45	45	52	38	33
rat 18	ethanol	43	53	53	49	51	51
rat 19	ethanol	45	52	52	35	43	38
rat 20	ethanol	48	40	40	43	50	43
rat 21	ethanol	50	48	48	40	50	42
rat 22	ethanol	48	40	40	35	36	33
rat 23	ethanol	40	44	44	35	33	33
rat 24	ethanol	44	48	48	48	50	47
rat 25	ethanol	45	45	45	39	38	35
rat 26	ethanol	50	51	51	46	36	40

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 11 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	47	52	48	45	47	44
rat 2	ethanol	48	43	41	46	46	42
rat 3	ethanol	51	50	47	49	49	44
rat 4	ethanol	51	52	52	34	34	43
rat 5	ethanol	51	53	54	46	46	45
rat 6	ethanol	52	53	46	38	38	36
rat 9	ethanol	51	49	45	50	50	46
rat 10	ethanol	50	48	50	37	37	34
rat 11	ethanol	45	47	45	50	50	35
rat 14	ethanol	44	46	46	34	34	35
rat 15	ethanol	52	44	43	44	44	51
rat 16	ethanol	51	46	52	48	48	50
rat 17	ethanol	47	45	45	40	40	37
rat 18	ethanol	55	53	51	53	53	58
rat 19	ethanol	52	53	52	54	54	59
rat 20	ethanol	52	51	56	39	39	43
rat 21	ethanol	51	45	50	46	46	49
rat 22	ethanol	50	40	48	34	34	32
rat 23	ethanol	42	40	44	29	29	28
rat 24	ethanol	41	47	50	38	38	48
rat 25	ethanol	50	55	52	45	45	42
rat 26	ethanol	53	43	53	35	35	28

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 12 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	47	52	48	45	47	44
rat 2	ethanol	48	43	41	46	46	42
rat 3	ethanol	51	50	47	49	55	44
rat 4	ethanol	51	52	52	34	37	43
rat 5	ethanol	51	53	54	46	45	45
rat 6	ethanol	52	53	46	38	37	36
rat 9	ethanol	51	49	45	50	49	46
rat 10	ethanol	50	48	50	37	37	34
rat 11	ethanol	45	47	45	50	45	35
rat 14	ethanol	44	46	46	34	42	35
rat 15	ethanol	52	44	43	44	49	51
rat 16	ethanol	51	46	52	48	51	50
rat 17	ethanol	47	45	45	40	35	37
rat 18	ethanol	55	53	51	53	48	58
rat 19	ethanol	52	53	52	54	55	59
rat 20	ethanol	52	51	56	39	42	43
rat 21	ethanol	51	45	50	46	46	49
rat 22	ethanol	50	40	48	34	37	32
rat 23	ethanol	42	40	44	29	29	28
rat 24	ethanol	41	47	50	38	44	48
rat 25	ethanol	50	55	52	45	36	42
rat 26	ethanol	53	43	53	35	41	28

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 13 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	44	39	41	32	31	35
rat 2	ethanol	45	44	46	32	25	31
rat 3	ethanol	45	46	50	54	52	48
rat 4	ethanol	43	50	47	23	33	41
rat 5	ethanol	49	50	48	42	50	42
rat 6	ethanol	46	45	39	45	43	52
rat 9	ethanol	56	54	54	43	31	27
rat 10	ethanol	46	39	49	45	48	39
rat 11	ethanol	37	49	40	30	31	29
rat 14	ethanol	39	43	44	25	27	28
rat 15	ethanol	43	45	46	35	38	30
rat 16	ethanol	39	38	45	42	49	53
rat 17	ethanol	42	42	44	39	37	45
rat 18	ethanol	45	51	46	45	48	51
rat 19	ethanol	44	55	51	32	33	44
rat 20	ethanol	45	48	46	36	36	36
rat 21	ethanol	47	48	48	41	45	40
rat 22	ethanol	42	55	50	40	35	29
rat 23	ethanol	35	40	45	40	33	31
rat 24	ethanol	51	45	46	40	47	37
rat 25	ethanol	45	43	42	43	45	39
rat 26	ethanol	51	49	45	38	40	35

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 14 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	40	47	40	36	32	40
rat 2	ethanol	43	46	45	27	27	29
rat 3	ethanol	46	44	40	48	48	48
rat 4	ethanol	40	33	40	41	50	41
rat 5	ethanol	50	47	38	46	43	43
rat 6	ethanol	44	46	44	44	46	45
rat 9	ethanol	50	47	50	34	41	30
rat 10	ethanol	45	47	45	51	45	48
rat 11	ethanol	44	40	39	37	42	40
rat 14	ethanol	42	43	47	28	35	28
rat 15	ethanol	42	45	39	47	45	41
rat 16	ethanol	45	48	49	50	50	42
rat 17	ethanol	48	40	46	46	45	40
rat 18	ethanol	47	46	50	41	45	37
rat 19	ethanol	56	50	54	33	37	35
rat 20	ethanol	41	42	46	47	39	40
rat 21	ethanol	42	47	47	51	40	49
rat 22	ethanol	54	49	50	28	30	43
rat 23	ethanol	44	45	49	42	44	46
rat 24	ethanol	51	49	41	53	54	43
rat 25	ethanol	42	44	41	48	45	43
rat 26	ethanol	50	44	50	50	49	41

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 15 (5g/kg ethanol)

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 1	ethanol	33	42	43	35	45	42
rat 2	ethanol	47	45	41	35	37	36
rat 3	ethanol	43	43	50	48	49	48
rat 4	ethanol	46	48	44	52	43	44
rat 5	ethanol	45	41	46	49	43	49
rat 6	ethanol	45	42	40	42	48	50
rat 9	ethanol	37	48	50	40	48	47
rat 10	ethanol	40	47	49	30	35	37
rat 11	ethanol	45	41	44	42	37	40
rat 15	ethanol	46	34	42	46	46	40
rat 16	ethanol	42	40	42	48	51	40
rat 17	ethanol	42	43	44	40	44	37
rat 18	ethanol	43	43	47	44	46	46
rat 19	ethanol	46	44	39	47	39	37
rat 20	ethanol	44	45	46	31	36	36
rat 21	ethanol	45	41	43	35	35	46
rat 22	ethanol	51	45	49	29	31	34
rat 23	ethanol	44	43	48	42	43	45
rat 24	ethanol	44	43	48	48	51	40
rat 25	ethanol	45	44	39	47	43	44
rat 26	ethanol	44	50	43	42	46	46

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Test Phase I

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 2	E-e 10%	38	45	44	44	50	38
rat 3	E-e 10%	44	47	49	52	51	50
rat 9	E-e 10%	47	46	43	46	41	45
rat 18	E-e 10%	51	46	40	45	47	45
rat 21	E-e 10%	46	41	49	51	50	50
rat 24	E-e 10%	45	50	47	46	47	49
rat 26	E-e 10%	48	51	48	54	54	45
rat 5	E-e 20%	49	48	50	46	46	49
rat 6	E-e 20%	53	52	49	52	52	52
rat 11	E-e 20%	44	43	47	46	47	44
rat 15	E-e 20%	48	40	50	44	43	44
rat 17	E-e 20%	46	47	43	46	51	45
rat 19	E-e 20%	49	49	50	40	57	57
rat 22	E-e 20%	43	44	48	40	49	47
rat 25	E-e 20%	42	40	45	47	49	50
rat 1	E-s	45	42	43	42	49	46
rat 4	E-s	48	46	42	51	56	53
rat 10	E-s	50	47	52	50	48	55
rat 14	E-s	48	49	52	41	47	41
rat 16	E-s	50	43	48	56	51	47
rat 20	E-s	45	47	48	47	49	43
rat 23	E-s	40	47	50	47	47	49

Chapter 3, Experiment 2A
Ataxia - Pre and Post Infusion Slip Scores, Test Phase II

		pre score:			post score:		
		0 min	5 min	10 min	5 min	10 min	15 min
Subject	Group						
rat 2	E-e 10%	39	36	44	55	53	52
rat 3	E-e 10%	47	55	50	55	55	54
rat 9	E-e 10%	49	43	42	48	44	42
rat 18	E-e 10%	49	46	51	45	42	49
rat 21	E-e 10%	49	52	47	46	52	44
rat 24	E-e 10%	44	47	50	46	52	50
rat 5	E-e 20%	47	54	50	55	46	55
rat 6	E-e 20%	50	41	56	51	51	49
rat 11	E-e 20%	47	49	49	50	50	55
rat 15	E-e 20%	49	41	43	48	44	52
rat 17	E-e 20%	44	51	50	51	49	51
rat 19	E-e 20%	51	47	53	49	58	53
rat 22	E-e 20%	45	45	48	52	54	42
rat 25	E-e 20%	44	46	45	50	51	48
rat 1	E-s	45	42	42	46	44	49
rat 4	E-s	45	51	50	54	56	57
rat 10	E-s	54	52	50	55	47	54
rat 14	E-s	40	48	43	46	45	47
rat 16	E-s	47	43	44	46	47	49
rat 20	E-s	45	46	42	49	45	48
rat 23	E-s	45	44	45	50	50	43

APPENDIX F

Raw data collected for experiment 2B presented in Chapter 3

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 1 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	45	52	50	35	40	48	47
rat 2	E-e 10%	48	40	49	34	39	49	42
rat 4	E-e 10%	55	39	48	45	34	37	39
rat 6	E-e 10%	46	55	45	48	47	44	38
rat 7	E-e 10%	47	50	46	47	47	53	46
rat 8	E-e 10%	33	40	40	35	38	36	48
rat 11	E-e 10%	47	45	48	42	38	44	44
rat 12	E-e 10%	44	47	59	27	36	37	39
rat 16	E-e 10%	47	52	51	34	39	34	55
rat 17	E-e 10%	54	50	51	41	47	42	43
rat 3	E-s	45	42	42	40	41	38	44
rat 5	E-s	51	49	57	53	58	56	58
rat 9	E-s	52	43	46	41	44	45	44
rat 10	E-s	48	50	50	47	49	44	53
rat 13	E-s	46	48	43	50	47	51	52
rat 14	E-s	53	47	53	53	47	55	45
rat 18	E-s	62	59	47	49	53	52	50
rat 19	E-s	48	50	44	35	35	42	44
rat 20	E-s	58	57	50	60	44	49	51

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 2 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	36	35	48	52	53	47	43
rat 2	E-e 10%	36	42	48	35	38	38	35
rat 4	E-e 10%	39	40	47	40	37	38	50
rat 6	E-e 10%	52	42	55	50	47	45	40
rat 7	E-e 10%	46	45	48	33	42	47	48
rat 8	E-e 10%	38	42	35	51	37	41	35
rat 11	E-e 10%	52	48	52	25	30	32	35
rat 12	E-e 10%	44	43	45	27	29	30	32
rat 16	E-e 10%	46	50	42	43	36	31	39
rat 17	E-e 10%	48	45	54	32	43	55	40
rat 3	E-s	45	38	46	43	50	47	55
rat 5	E-s	37	40	42	32	40	41	40
rat 9	E-s	55	47	52	35	37	47	45
rat 10	E-s	39	47	58	53	48	53	50
rat 13	E-s	47	47	51	52	48	42	48
rat 14	E-s	52	52	47	55	52	53	46
rat 18	E-s	51	46	53	53	35	45	47
rat 19	E-s	45	47	52	22	40	34	41
rat 20	E-s	48	51	57	25	45	47	42

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 3 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	37	48	34	42	42	39	48
rat 2	E-e 10%	39	39	39	29	33	34	39
rat 4	E-e 10%	43	45	42	42	35	46	40
rat 6	E-e 10%	35	37	38	40	49	47	46
rat 7	E-e 10%	49	50	48	40	38	42	43
rat 8	E-e 10%	30	43	40	31	35	39	45
rat 11	E-e 10%	59	53	50	21	42	40	29
rat 12	E-e 10%	52	43	49	25	32	31	34
rat 16	E-e 10%	52	55	60	21	35	37	32
rat 17	E-e 10%	44	45	40	31	35	37	32
rat 3	E-s	52	50	53	49	38	50	44
rat 5	E-s	47	44	53	45	35	35	41
rat 9	E-s	47	42	41	29	48	54	55
rat 10	E-s	57	57	54	44	45	51	50
rat 13	E-s	49	52	52	43	45	43	48
rat 14	E-s	56	59	51	57	52	45	59
rat 18	E-s	53	55	56	40	44	43	37
rat 19	E-s	46	53	59	35	45	44	31
rat 20	E-s	47	57	54	31	41	44	45

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 4 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	55	49	53	53	62	62	61
rat 2	E-e 10%	52	48	43	48	45	50	58
rat 4	E-e 10%	41	45	47	44	54	54	47
rat 6	E-e 10%	54	57	49	53	59	60	60
rat 7	E-e 10%	59	53	51	53	57	61	60
rat 8	E-e 10%	54	53	58	54	59	58	55
rat 11	E-e 10%	58	57	54	54	56	58	55
rat 12	E-e 10%	51	53	54	51	53	54	53
rat 16	E-e 10%	53	51	47	56	57	45	55
rat 17	E-e 10%	41	42	39	42	41	40	43
rat 3	E-s	49	46	54	60	55	57	58
rat 5	E-s	52	49	57	53	58	56	58
rat 9	E-s	57	50	54	61	58	59	61
rat 10	E-s	56	55	42	52	58	58	61
rat 13	E-s	50	51	56	47	52	56	51
rat 14	E-s	59	57	59	62	59	60	65
rat 18	E-s	45	50	45	57	49	56	56
rat 19	E-s	56	53	50	58	58	54	54
rat 20	E-s	52	53	50	61	54	55	55

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 5 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	44	44	54	54	50	55	61
rat 2	E-e 10%	45	45	44	32	30	32	30
rat 4	E-e 10%	44	58	54	28	32	30	38
rat 6	E-e 10%	54	48	58	44	56	50	51
rat 7	E-e 10%	58	58	56	36	52	46	53
rat 8	E-e 10%	38	50	45	29	35	40	37
rat 11	E-e 10%	57	46	59	29	38	35	36
rat 12	E-e 10%	55	50	53	31	33	38	41
rat 16	E-e 10%	55	60	60	28	36	37	37
rat 17	E-e 10%	41	36	36	28	35	35	44
rat 3	E-s	53	53	56	30	42	43	48
rat 5	E-s	50	51	53	46	54	48	50
rat 9	E-s	54	60	47	34	47	53	55
rat 10	E-s	55	44	60	46	48	46	45
rat 13	E-s	47	50	47	48	53	55	60
rat 14	E-s	62	64	48	45	54	51	61
rat 18	E-s	63	51	63	46	52	54	54
rat 19	E-s	47	50	55	38	50	38	46
rat 20	E-s	58	57	58	33	47	52	60

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 6 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	52	52	52	53	53	61	53
rat 2	E-e 10%	40	40	47	20	32	33	28
rat 4	E-e 10%	38	39	49	28	28	29	29
rat 6	E-e 10%	48	49	44	48	53	53	57
rat 7	E-e 10%	50	48	42	43	53	46	47
rat 8	E-e 10%	43	40	38	26	26	40	38
rat 11	E-e 10%	48	48	52	28	30	28	29
rat 12	E-e 10%	46	48	42	45	38	39	40
rat 16	E-e 10%	55	57	61	41	43	50	46
rat 17	E-e 10%	40	38	38	42	38	33	35
rat 3	E-s	49	45	56	46	52	48	60
rat 5	E-s	47	47	47	36	41	50	38
rat 9	E-s	51	60	49	57	50	45	59
rat 10	E-s	52	50	56	61	60	59	59
rat 13	E-s	45	51	51	46	48	50	49
rat 14	E-s	61	63	60	46	52	42	52
rat 18	E-s	44	60	50	56	55	51	58
rat 19	E-s	55	57	57	53	41	36	40
rat 20	E-s	54	58	59	56	51	53	49

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 7 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	43	50	46	53	60	61	67
rat 2	E-e 10%	53	47	41	25	33	35	29
rat 4	E-e 10%	51	33	47	31	27	27	28
rat 6	E-e 10%	50	46	36	38	45	51	50
rat 7	E-e 10%	56	48	49	50	43	45	44
rat 8	E-e 10%	37	36	35	39	26	30	22
rat 11	E-e 10%	50	55	55	27	27	28	28
rat 12	E-e 10%	55	55	49	24	27	31	27
rat 16	E-e 10%	37	55	47	29	30	24	29
rat 17	E-e 10%	28	30	27	45	27	28	29
rat 3	E-s	54	53	51	30	32	34	27
rat 5	E-s	43	41	50	54	55	56	50
rat 9	E-s	50	61	60	42	35	52	34
rat 10	E-s	47	48	53	48	40	41	51
rat 13	E-s	41	49	37	41	45	50	41
rat 14	E-s	61	56	53	38	42	41	43
rat 18	E-s	53	43	47	51	48	40	46
rat 19	E-s	45	42	54	24	26	25	31
rat 20	E-s	50	49	46	52	46	45	43

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 8 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	54	46	55	59	51	52	51
rat 2	E-e 10%	48	43	48	28	27	28	27
rat 4	E-e 10%	43	42	42	38	36	40	45
rat 6	E-e 10%	48	57	52	49	54	55	49
rat 7	E-e 10%	47	41	48	45	59	52	56
rat 8	E-e 10%	33	40	50	27	29	36	41
rat 11	E-e 10%	51	59	57	44	58	62	56
rat 12	E-e 10%	38	48	49	51	41	52	41
rat 16	E-e 10%	59	53	56	43	52	48	48
rat 17	E-e 10%	32	35	34	40	37	35	38
rat 3	E-s	52	42	39	43	47	49	54
rat 5	E-s	49	50	50	26	29	35	33
rat 9	E-s	37	44	40	34	36	31	38
rat 10	E-s	47	40	53	57	51	45	50
rat 13	E-s	45	52	38	49	44	53	51
rat 14	E-s	59	59	51	57	49	48	49
rat 18	E-s	53	43	47	40	46	47	58
rat 19	E-s	57	55	49	44	38	31	32
rat 20	E-s	58	54	68	59	52	49	43

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 9 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	45	42	55	48	46	59	60
rat 2	E-e 10%	39	60	40	33	44	30	40
rat 4	E-e 10%	47	49	49	39	33	37	37
rat 6	E-e 10%	49	52	49	43	50	47	55
rat 7	E-e 10%	50	55	58	40	46	37	46
rat 8	E-e 10%	46	42	45	33	41	37	45
rat 11	E-e 10%	50	45	48	34	45	41	43
rat 12	E-e 10%	49	50	52	32	35	50	37
rat 16	E-e 10%	57	48	52	40	46	41	36
rat 17	E-e 10%	39	35	34	37	36	37	27
rat 3	E-s	47	37	42	53	50	49	55
rat 5	E-s	40	43	41	42	38	35	32
rat 9	E-s	52	57	57	31	40	32	39
rat 10	E-s	55	43	56	40	38	31	38
rat 13	E-s	58	54	51	50	51	43	47
rat 14	E-s	65	59	60	57	46	34	48
rat 18	E-s	55	48	48	29	37	38	35
rat 19	E-s	48	47	50	35	37	37	33
rat 20	E-s	57	56	56	31	49	47	40

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 10 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	57	58	59	60	52	60	57
rat 2	E-e 10%	49	48	57	25	35	33	36
rat 4	E-e 10%	53	48	53	36	41	32	33
rat 6	E-e 10%	52	57	60	47	57	50	50
rat 7	E-e 10%	48	52	48	36	31	33	40
rat 8	E-e 10%	55	47	56	29	32	33	35
rat 11	E-e 10%	55	55	52	28	33	37	40
rat 12	E-e 10%	56	50	47	40	40	38	33
rat 16	E-e 10%	44	47	45	34	29	30	40
rat 17	E-e 10%	30	44	44	29	29	29	32
rat 3	E-s	51	44	47	40	31	34	32
rat 5	E-s	46	45	40	30	32	28	30
rat 9	E-s	45	50	54	26	31	39	36
rat 10	E-s	59	41	55	35	30	30	27
rat 13	E-s	48	50	52	51	45	50	43
rat 14	E-s	52	56	53	53	46	41	39
rat 18	E-s	47	44	45	29	29	32	35
rat 19	E-s	45	48	45	39	36	36	36
rat 20	E-s	50	40	57	41	50	49	49

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 11 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	60	51	53	58	56	54	49
rat 2	E-e 10%	48	42	44	26	34	37	33
rat 4	E-e 10%	44	42	52	29	31	27	33
rat 6	E-e 10%	48	59	56	47	53	51	56
rat 7	E-e 10%	49	59	59	48	46	35	36
rat 8	E-e 10%	51	53	46	25	30	41	36
rat 11	E-e 10%	47	49	47	25	33	40	32
rat 12	E-e 10%	51	42	49	32	37	33	36
rat 16	E-e 10%	47	46	54	43	37	38	36
rat 17	E-e 10%	33	32	31	40	33	42	41
rat 3	E-s	48	44	41	55	52	52	49
rat 5	E-s	44	44	53	30	32	36	38
rat 9	E-s	46	59	57	36	36	35	31
rat 10	E-s	51	44	42	47	33	33	37
rat 13	E-s	49	56	58	41	49	44	40
rat 14	E-s	54	59	60	44	48	45	52
rat 18	E-s	48	41	50	46	53	52	57
rat 19	E-s	48	52	53	26	39	35	35
rat 20	E-s	60	55	52	47	50	56	56

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 12 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	47	42	47	54	47	57	52
rat 2	E-e 10%	52	38	34	25	31	34	29
rat 4	E-e 10%	38	38	39	28	37	34	35
rat 6	E-e 10%	58	58	60	45	56	47	55
rat 7	E-e 10%	47	52	45	32	39	33	45
rat 8	E-e 10%	42	43	49	25	28	38	47
rat 11	E-e 10%	47	52	48	30	26	31	31
rat 12	E-e 10%	46	45	48	28	37	34	33
rat 16	E-e 10%	55	48	58	30	47	40	33
rat 17	E-e 10%	37	38	55	40	31	30	33
rat 3	E-s	47	47	52	46	51	50	51
rat 5	E-s	48	47	54	27	38	32	35
rat 9	E-s	44	48	44	27	35	37	28
rat 10	E-s	47	45	47	31	3	34	31
rat 13	E-s	40	49	50	46	40	48	44
rat 14	E-s	53	50	56	53	41	42	43
rat 18	E-s	58	52	44	58	57	51	46
rat 19	E-s	51	51	55	26	34	33	37
rat 20	E-s	56	64	61	50	48	55	51

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 13 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	45	53	53	52	60	64	61
rat 2	E-e 10%	38	42	44	31	35	35	36
rat 4	E-e 10%	49	48	42	33	48	47	45
rat 6	E-e 10%	54	56	48	50	60	60	60
rat 7	E-e 10%	48	53	58	50	65	71	63
rat 8	E-e 10%	35	36	39	40	51	50	52
rat 11	E-e 10%	51	53	52	36	40	41	33
rat 12	E-e 10%	47	56	60	30	35	46	37
rat 16	E-e 10%	57	54	54	30	31	34	33
rat 17	E-e 10%	44	51	51	28	33	36	32
rat 3	E-s	51	42	40	37	60	60	62
rat 5	E-s	43	33	37	38	32	37	29
rat 9	E-s	51	52	46	47	63	60	56
rat 10	E-s	47	42	45	41	37	35	41
rat 13	E-s	50	57	56	49	44	47	51
rat 14	E-s	62	58	55	52	43	35	32
rat 18	E-s	55	63	60	43	53	41	48
rat 19	E-s	50	61	58	25	35	39	37
rat 20	E-s	60	64	65	62	53	30	43

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 14 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	53	61	53	47	50	64	60
rat 2	E-e 10%	44	50	43	40	49	57	54
rat 4	E-e 10%	43	45	41	37	39	38	33
rat 6	E-e 10%	65	64	65	46	52	48	46
rat 7	E-e 10%	64	52	53	50	58	64	65
rat 8	E-e 10%	52	48	50	33	38	35	33
rat 11	E-e 10%	55	58	54	33	33	44	33
rat 12	E-e 10%	55	52	55	49	49	37	45
rat 16	E-e 10%	50	51	58	37	40	40	36
rat 17	E-e 10%	40	54	48	42	42	43	39
rat 3	E-s	50	47	45	31	54	47	39
rat 5	E-s	45	45	55	35	37	40	33
rat 9	E-s	49	57	53	45	48	51	53
rat 10	E-s	41	42	43	31	37	37	33
rat 13	E-s	40	46	48	56	53	60	54
rat 14	E-s	57	58	58	64	41	40	51
rat 18	E-s	48	64	53	50	49	55	43
rat 19	E-s	63	54	63	37	39	39	29
rat 20	E-s	58	64	53	60	59	54	55

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 15 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	57	51	61	58	53	55	58
rat 2	E-e 10%	49	47	48	40	37	35	37
rat 4	E-e 10%	43	39	49	39	36	37	35
rat 6	E-e 10%	52	60	57	53	52	52	45
rat 7	E-e 10%	51	48	49	51	47	55	51
rat 8	E-e 10%	50	50	48	38	38	36	40
rat 11	E-e 10%	50	42	41	39	42	43	49
rat 12	E-e 10%	55	50	55	46	36	45	44
rat 16	E-e 10%	51	53	53	46	53	44	48
rat 17	E-e 10%	48	48	50	39	45	38	37
rat 3	E-s	48	36	55	54	49	40	38
rat 5	E-s	52	48	56	45	39	37	42
rat 9	E-s	63	62	56	48	53	49	45
rat 10	E-s	43	42	46	35	44	46	41
rat 13	E-s	47	48	54	50	58	56	55
rat 14	E-s	48	53	52	47	41	43	43
rat 18	E-s	49	47	57	37	37	39	40
rat 19	E-s	43	48	60	37	40	44	47
rat 20	E-s	58	62	60	60	56	48	51

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 16 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	53	53	57	61	60	58	63
rat 2	E-e 10%	45	47	42	30	36	37	39
rat 4	E-e 10%	44	42	47	29	37	38	37
rat 6	E-e 10%	56	58	58	50	56	58	62
rat 7	E-e 10%	53	56	57	53	62	60	52
rat 8	E-e 10%	46	39	50	32	37	38	39
rat 11	E-e 10%	58	55	52	36	40	32	35
rat 12	E-e 10%	58	53	57	37	35	38	43
rat 16	E-e 10%	56	53	48	59	51	45	50
rat 17	E-e 10%	38	39	42	34	33	37	39
rat 3	E-s	53	40	43	57	54	50	53
rat 5	E-s	40	45	47	35	36	41	41
rat 9	E-s	55	52	59	56	50	53	60
rat 10	E-s	47	40	43	30	40	44	43
rat 13	E-s	55	58	58	49	49	54	57
rat 14	E-s	52	56	58	56	44	53	50
rat 18	E-s	52	45	46	44	34	37	39
rat 19	E-s	46	58	56	34	43	45	49
rat 20	E-s	53	62	54	56	45	54	55

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 17 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	54	59	53	53	51	55	53
rat 2	E-e 10%	44	49	47	35	31	33	37
rat 4	E-e 10%	49	47	49	30	27	33	35
rat 6	E-e 10%	52	46	48	51	47	48	51
rat 7	E-e 10%	58	57	57	51	54	59	58
rat 8	E-e 10%	37	51	57	53	50	52	52
rat 11	E-e 10%	47	48	48	28	31	38	40
rat 12	E-e 10%	49	49	48	42	43	32	32
rat 16	E-e 10%	36	42	40	40	40	32	33
rat 17	E-e 10%	55	54	45	46	55	47	44
rat 3	E-s	49	44	45	63	53	50	55
rat 5	E-s	45	50	40	41	41	38	52
rat 9	E-s	47	55	57	41	35	35	35
rat 10	E-s	53	51	43	41	47	51	54
rat 13	E-s	47	46	50	50	50	52	50
rat 14	E-s	50	48	47	52	48	51	47
rat 18	E-s	41	39	42	39	37	37	32
rat 19	E-s	47	43	52	39	33	27	45
rat 20	E-s	44	43	50	60	58	58	58

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 18 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	59	59	52	54	52	50	59
rat 2	E-e 10%	40	39	40	47	41	36	34
rat 4	E-e 10%	38	46	49	31	33	31	31
rat 6	E-e 10%	47	50	49	54	48	49	53
rat 7	E-e 10%	52	51	59	54	51	49	53
rat 8	E-e 10%	51	47	40	40	41	34	41
rat 11	E-e 10%	51	45	50	42	40	43	40
rat 12	E-e 10%	53	50	44	41	37	40	41
rat 16	E-e 10%	45	47	51	48	44	46	51
rat 17	E-e 10%	36	41	37	33	35	40	41
rat 3	E-s	54	44	48	52	48	48	61
rat 5	E-s	55	51	55	36	38	41	40
rat 9	E-s	53	53	56	37	33	34	33
rat 10	E-s	43	44	46	44	49	44	37
rat 13	E-s	48	45	43	50	52	44	46
rat 14	E-s	49	49	50	51	48	46	50
rat 18	E-s	40	40	47	35	38	39	39
rat 19	E-s	41	51	49	42	40	38	42
rat 20	E-s	50	50	55	51	50	52	51

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 19 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	40	47	47	52	53	56	49
rat 2	E-e 10%	41	38	43	36	36	37	36
rat 4	E-e 10%	40	40	42	32	41	33	34
rat 6	E-e 10%	42	48	48	52	45	51	51
rat 7	E-e 10%	51	51	55	53	45	57	54
rat 8	E-e 10%	47	47	45	37	41	36	35
rat 11	E-e 10%	67	58	54	34	33	34	41
rat 12	E-e 10%	50	53	53	37	34	39	39
rat 16	E-e 10%	56	54	59	53	45	49	46
rat 17	E-e 10%	45	42	47	45	35	43	37
rat 3	E-s	43	40	39	52	49	51	49
rat 5	E-s	42	45	48	47	33	32	38
rat 9	E-s	45	52	45	37	35	36	38
rat 10	E-s	50	50	51	44	37	48	41
rat 13	E-s	47	48	47	50	51	51	51
rat 14	E-s	50	51	46	50	51	49	56
rat 18	E-s	61	51	45	34	34	36	37
rat 19	E-s	53	54	53	35	37	32	41
rat 20	E-s	58	62	61	55	53	51	40

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Training Phase Day 20 (6g/kg ethanol)

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	57	48	58	57	57	56	57
rat 2	E-e 10%	48	40	45	33	42	39	37
rat 4	E-e 10%	40	45	44	39	37	37	37
rat 6	E-e 10%	58	53	48	56	55	55	58
rat 7	E-e 10%	41	40	45	58	58	62	58
rat 8	E-e 10%	53	49	55	36	41	42	40
rat 11	E-e 10%	57	56	58	34	36	35	33
rat 12	E-e 10%	55	63	54	37	38	34	33
rat 16	E-e 10%	52	55	52	41	45	43	43
rat 17	E-e 10%	40	40	43	37	40	43	46
rat 3	E-s	48	46	51	57	59	59	54
rat 5	E-s	56	53	55	40	36	43	38
rat 9	E-s	51	53	56	36	37	38	40
rat 10	E-s	44	46	47	50	56	53	51
rat 13	E-s	48	56	59	52	51	53	50
rat 14	E-s	53	58	55	54	57	54	55
rat 18	E-s	55	65	56	52	56	53	60
rat 19	E-s	57	52	57	43	45	42	48
rat 20	E-s	53	53	60	55	58	60	61

Chapter 3, Experiment 2B
Ataxia - Pre and Post Infusion Slip Scores, Test Phase

		pre score:			post score:			
		0 min	30 sec	1 min	0 min	5 min	10 min	15 min
Subject	Group							
rat 1	E-e 10%	57	50	61	53	62	59	58
rat 2	E-e 10%	53	55	48	31	36	34	34
rat 4	E-e 10%	57	56	57	65	58	46	50
rat 6	E-e 10%	58	55	47	56	51	52	50
rat 7	E-e 10%	55	71	63	61	54	60	59
rat 8	E-e 10%	53	58	58	37	37	34	34
rat 11	E-e 10%	49	50	53	35	28	37	32
rat 12	E-e 10%	52	55	49	35	41	34	36
rat 16	E-e 10%	59	50	52	39	52	63	52
rat 17	E-e 10%	42	39	41	40	41	37	38
rat 3	E-s	58	59	50	52	55	55	56
rat 5	E-s	55	57	56	28	43	41	43
rat 9	E-s	62	59	54	37	35	33	30
rat 10	E-s	47	53	51	50	50	50	45
rat 13	E-s	52	57	53	56	47	50	48
rat 14	E-s	64	62	63	59	54	55	54
rat 18	E-s	54	52	55	32	37	34	37
rat 19	E-s	55	60	58	34	39	41	54
rat 20	E-s	56	57	58	53	56	57	51