

Exploratory Research

An overview of research using the one atmosphere uniform glow discharge plasma (OAUGDP) for sterilization of surfaces and materials

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Author(s)

Montie, T.C.

Dept. of Microbiol., Tennessee Univ., Knoxville, TN, USA

Kelly-Wintenberg, K. ; Reece Roth, J.

Abstract

The medical, food processing, and heating, ventilating, and air conditioning industries are searching for improved pasteurization, disinfection, and sterilization technologies. Candidate techniques must deal with and overcome such problems as thermal sensitivity and destruction by heat, formation of toxic by-products, costs, and inefficiency in performance. We report the results of a plasma source, the One Atmosphere Uniform Glow Discharge Plasma (OAUGDP), which operates at atmospheric pressure in air and produces antimicrobial active species at room temperature, OAUGDP exposures have reduced log numbers of Gram negative and Gram positive bacteria, bacterial endospores, yeast, and bacterial viruses on a variety of surfaces. The nature of the surface influenced the degree of lethality, with microorganisms on polypropylene being most sensitive, followed by glass, and cells embedded in agar. Experimental results showed at least a $5 \log_{10}$ CFU reduction in bacteria within a range of 50-90 s of exposure. After 10-25 s of exposure, macromolecular leakage and bacterial fragmentation were observed. Vulnerability of cell membranes to reactive oxygen species (ROS) is hypothesized. Results from several novel OAUGDP configurations are presented, including a remote exposure reactor (RER) which uses transported active species to sterilize material located more than 20 cm from the plasma generation site, and a second planar electrode configuration developed for air filter sterilization. Applications of these technologies to the healthcare industry, the food industry, and decontaminating surfaces compromised by biological warfare agents are discussed

An exploratory study examining the influence of translation on the validity and reliability of qualitative data in nursing research

Sheila Twinn PhD PGCEA BA RGN RHV

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ABSTRACT

Although the complexity of undertaking qualitative research with non-English speaking informants has become increasingly recognized, few empirical studies exist which explore the influence of translation on the findings of the study. The aim of this exploratory study was therefore to examine the influence of translation on the reliability and validity of the findings of a qualitative research study. In-depth interviews were undertaken in Cantonese with a

convenience sample of six women to explore their perceptions of factors influencing their uptake of Pap smears. Data analysis involved three stages. The first stage involved the translation and transcription of all the interviews into English independently by two translators as well as transcription into Chinese by a third researcher. The second stage involved content analysis of the three data sets to develop categories and themes and the third stage involved a comparison of the categories and themes generated from the Chinese and English data sets. Despite no significant differences in the major categories generated from the Chinese and English data, some minor differences were identified in the themes generated from the data. More significantly the results of the study demonstrated some important issues to consider when using translation in qualitative research, in particular the complexity of managing data when no equivalent word exists in the target language and the influence of the grammatical style on the analysis. In addition the findings raise questions about the significance of the conceptual framework of the research design and sampling to the validity of the study. The importance of using only one translator to maximize the reliability of the study was also demonstrated. In addition the author suggests the findings demonstrate particular problems in using translation in phenomenological research designs.

Descriptive research

A meta-analysis of the past 25 years of weight loss research using diet, exercise or diet plus exercise intervention.

- **Source:** International Journal of Obesity & Related Metabolic Disorders . Oct1997, Vol. 21 Issue 10, p941. 7p.
- **Author(s):** Miller, W C; Koceja, D M; Hamilton, E J
- **Subject Terms:** *WEIGHT loss *OBESITY

Abstract:

OBJECTIVE: The therapeutic effectiveness of diet, exercise, and diet plus exercise for weight loss in obesity was determined. DATA SOURCES: All human research reported in English, published in peer-reviewed scientific journals within the past 25 y was reviewed. STUDY SELECTION: Acceptance criteria ($n = 493$ from > 700 studies) were that a therapeutic intervention of diet, exercise or diet plus exercise was employed, specifically for weight reduction in obese adult humans and that weight change was reported numerically. Only aerobic exercise studies were included, while drug, hormone and surgical treatments were excluded. DATA EXTRACTION: All data were extracted by the same investigator from the original research report. Except for gender and program type, all extracted data were numerical. DATA SYNTHESIS: ANOVA, with a Newman-Keuls post hoc test, was used to determine differences among programs ($P < 0.05$). One analysis was performed on the group mean data and one based on effect sizes. Analyses were repeated using initial body weight, initial percent body fat and program length, as covariates. RESULTS: Primarily, subjects aged 40 y have been studied (39.5 ± 0.4 y, mean \pm s.e.m.) who are only moderately obese (92.7 ± 0.9 kg, 33.2 ± 0.5 body mass index (BMI), $33.4 \pm 0.7\%$ body fat); for short durations (15.6 ± 0.6 weeks). Exercise studies were of a shorter duration, used younger subjects who weighed less, had lower BMI and percentage body fat values, than diet or diet plus exercise studies. Despite these differences, weight lost through diet, exercise and diet plus exercise was 10.7 ± 0.5 , 2.9 ± 0.4 ^{*} and 11.0 ± 0.6 kg, respectively. However, at one-year follow-up, diet plus exercise tended to be the superior program. Effect size and covariate analyses revealed similar program differences. CONCLUSION: Weight loss research over the past 25 y has been very narrowly focused on a middle age population...

The Discourse of Computer-Assisted Language Learning: Toward a Context for Descriptive Research

CAROL CHAPELLE[†]

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Abstract

Understanding how the speed, power, and flexibility of computers can facilitate second language acquisition is an intriguing challenge faced by instructors, researchers, and theorists. Progress in this area, however, does not appear to be forthcoming from current research on computer-assisted language learning (CALL), which suffers from the same limitations as early research on classroom instruction: Little detail is provided to describe the interaction among participants during instruction (Long, 1980). Moreover, descriptions of CALL activities included in reported research are not empirically based: They fail to describe what subjects actually do while working with CALL. A third problem is that the terms used to describe CALL activities have been developed specifically for that purpose, and are therefore not comparable to those used for classroom activities. At the same time, these descriptors are not sufficiently uniform and formally stated to allow specific comparisons among CALL activities. Toward a solution to these problems, this paper proposes a discourse analysis of student-computer interaction enabled by viewing the student and the computer as two participants in a dialogue. It argues that the discourse analysis system of classroom interaction developed by Sinclair and Coulthard (1975) provides the necessary elements and structures to describe CALL discourse, analyze data from student-computer interaction, and compare CALL activities with other (classroom) activities.

Hypothesis Testing

A cognitive theory of learning: Research on hypothesis testing.

Levine, Marvin

Oxford, England: Lawrence Erlbaum. (1975). xii 313 pp.

Abstract

Surveys hypothesis-testing theories, reviewing the continuity-noncontinuity controversy, stimulus sampling theory, and the conversion of leading conditioning theorists to a noncontinuity position. The phenomena of partial reinforcement effects, the matching law, the awareness controversy, Einstellung, learning sets, strategy analyses, and the reversal-nonreversal shift comparison are discussed. (9 p ref) (PsycINFO Database Record (c) 2012 APA, all rights reserved)

Cerebral Lateralization Biological Mechanisms, Associations, and Pathology: I. A Hypothesis and a Program for Research

Norman Geschwind, MD; Albert M. Galaburda, MD

Arch Neurol. 1985;42(5):428-459. doi:10.1001/archneur.1985.04060050026008.

Abstract

We present a set of hypotheses about the biologic mechanisms of lateralization, ie, the processes which lead to an asymmetrical nervous system. It would have been difficult even 20 years ago to formulate such a theory in the face of the prevalent belief that cerebral dominance lacked an anatomic correlate. It is proposed that cerebral dominance is based in most instances on asymmetries of structure. Although genetic factors are important we will lay stress on several factors that, in the course of development, both prenatal and postnatal, modify the direction and extent of these structural differences. Special attention will be directed to the intrauterine environment as a determinant of the pattern of asymmetries, and in particular sex hormones, eg, testosterone or related factors. We will discuss the associations of anomalous cerebral dominance which include not only developmental disorders such as dyslexia and certain