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A Trial of the Effects of Intercessory Prayer on Student Performance

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A Trial of the Effects of Intercessory Prayer on Student Performance

BY

Christopher Clark

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Master of Arts in Clinical Psychology

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

2003
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A Trial of the Effects of Intercessory Prayer on Student Performance.

Christopher Clark

Eastern Illinois University.

Abstract

The purpose of the present study is to test the efficacy of intercessory prayer on academic performance. One hundred and four students enrolled in a college business class and 63 regular church attendees volunteered to participate in the study. Design for the study was a matched groups reversal design. The students were paired according to their GPA's and randomly assigned to one of two groups. The first test of the semester constituted a baseline measure. For the first four-week period of the class and the first test, neither of the groups received prayer. Next, the church goers each received the names of 3-5 students from the first group, just prior to the time when prayer was implemented. During the second four-week period, the church goers prayed daily for the students in the first group, praying specifically for a high test score on their second test. After the students took the second test, the intercessors were instructed to stop praying for the students. They were then given the names of 3-5 students in the second group and for the third four-week period, prayed specifically for the students' success on the third test. No significant differences in test grades were found when students were prayed for. Possible reasons for results are discussed in addition to suggestions for further research.

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Introduction

For numerous individuals, prayer is a part of life. Prayer is part of who they are as human beings. A recent Gallup Poll (“Religion in America,” 1994) investigating the prayer habits of Americans reports that 90% of Americans pray. And of those who pray, 97% believe their prayers are heard and 95% believe their prayers have been answered. That means that more than 8 out of 10 people in this country have prayed and believe that their prayers have been answered.

Seemingly since the beginning of time, individuals have been praying to gods for health, prosperity, and answers to questions of the unknown. The Bible records numerous examples of individuals praying to their God. For example, Isaac prayed to God on behalf of his wife when she could not bear children, Job prayed when he was suffering from physical ailments, and King David prayed for guidance when he was attacked by the Philistines. In all of the above examples, the outcomes of the events in which the individuals prayed were to their advantage. In other words, they got what they prayed for, and they attributed it to God.

For many that pray, the act of praying is based on a faith in an external, higher power. They believe that this higher power will react to the prayer in a positive way and change the circumstances for the person who prays. For the Christian, this belief stems directly from the teachings of Jesus. He said: “Ask and you will receive...Everyone who asks will receive”.

But does prayer work? Those who attend religious services on a regular occasion may be likely to hear testimonies of prayer’s effectiveness. But self reports of prayer’s effectiveness are difficult to validate, not because the individuals are intentionally

fabricating their experiences of the power of prayer, but because individuals with high expectancy are likely to be perceptually biased. For example, the healing of a disease may happen naturally with the aid of the body's own natural healing properties, but an individual who prays may believe the healing was the result of a heavenly intervention. Self reported claims that prayers were answered may simply be the result of a biased perception of a naturally occurring event. When prayer and aspirin are applied to aid a headache, an individual who believes in prayer may be more likely to attribute the healing to the prayer than to the aspirin. Furthermore, it is even possible that a person may pray for something good to happen, and by sheer coincidence, something bad happens. In this situation the negative event is probably attributed to coincidence due to the biased perception. In addition, it is evident that sometimes prayers go unanswered. For if they were, how many droughts, floods, hurricanes and plagues would have been avoided.

But the question still arises as to whether prayer is significantly effective in changing life in any way. There have been numerous experiments performed on the effects of prayer on various life forms. But in many of the studies it is likely that the improvements occur due to psychosomatic reasons. For this reason, many researchers implement procedures where the subjects and/or researchers in the experiments are unaware of who is being prayed for. This helps rule out any placebo effects. Subjects did not get better because they believed they would or because doctors thought they would and somehow unconsciously communicated this belief to their patients. Studies implementing these procedures have found interesting but mixed results as to the efficacy of prayer and they suggest the need for further research to clarify if and under what

circumstances prayer has effects.

Purpose

The intent of the present study is to help clarify the claims that prayer has an influencing effect on human behavior and outcome. It will help researchers gain a better understanding of prayer and the effect it may have on those being prayed for. By observing prayer in a controlled environment, this study will attempt to elicit and record any direct effects of blind intercessory prayer.

Review of Related Material

The first prayer study to be published investigated the effects of self prayer on the clergy. Galton (1883, as cited in Joyce and Welldon, 1965) made two reasonable assumptions. The first assumption was that the clergy were a class of individuals that were more prayerfully minded than lawyers and doctors and as so they prayed more often. Praying was after all part of their job. The second assumption was that the clergy were more likely to be prayed for by others than the two other groups. If the act of praying and being subjected to prayer had an effect on longevity, then the clergy should live longer than the other two groups. Results of Galton's studies concluded the opposite. The clergy lived, on average, shorter lives than the other two groups. Galton's study of prayer was the first of its kind and led to further research on prayer.

More recently, scientific studies have investigated and reported the effects of prayer on psychological and physiological variables. Khouzam (1996) reported a case study of an elderly man who developed a major depressive episode after being diagnosed with cancer of the prostate. The elderly man proceeded to pray Christian prayers for recovery after hearing about his diagnosis. After prayers were initiated, his depression

remitted independently of his underlying progression of cancer. A conclusion was made that personal prayer can have positive effects on psychological well-being of individuals who pray for themselves.

Ai and colleagues (1998) investigated the effects of personal prayer on the psychological symptoms of postoperative patients. The researchers were interested in looking at the many different aspects of postoperative behaviors and psychological recovery, including the use of prayer. Results of the study showed that most patients did pray about their postoperative problems. In addition, when they compared those who prayed with those who did not, those who prayed appeared to have a significantly greater decrease in depression and general distress one year after heart surgery.

Chan (1995) conducted a controlled experiment investigating the effects of personal prayer when participants prayed for themselves daily for ten minutes. Participants prayed about their most current anxiety provoking life events. Pretest and posttest anxiety scores were recorded and compared with two different groups: a group of subjects who wrote to a friend about their anxiety provoking life events and another group who read and wrote about inspirational stories. Those who prayed about the events had more immediate state-anxiety reduction when compared with the other two groups. Prayer seems to be a beneficial tool in decreasing anxiety levels and can work more efficiently than often used alternative methods.

Stavros (1998) performed a similar study where he administered a number of subjective tests, including measures of behavioral health, to 110 Eastern Orthodox Christians. Then he had half of his participants pray the Jesus Prayer (“Lord Jesus Christ, have mercy on me”) continually for ten minutes while sitting alone quietly. The other

half did not. The tests were again administered to all subjects. Results concluded that subjects who prayed had lower depression, anxiety, hostility and interpersonal sensitivity scores, in addition to an enhanced relationship with God as perceived by the individual

Meisenhelder and Chandler (2000) had regular church attendees complete a medical outcomes health survey and report the details of their prayer habits. Results show that frequent prayer was significantly associated with high mental health scores.

A report by Hughes and Timmerman (1997) suggests that prayer may also positively influence physical health. The subject of the report, a young woman, prayed rigorously for healing after being diagnosed with cervical cancer. A short time later she received a clean bill of health during a follow up visit. Although the true cause of her healing is unknown, the woman believes that her prayers to God were answered and that God made her well.

The above studies and reports suggest that self prayer can have a positive influence on health and well being. However, a problem exists when studying self prayer because the physical act of praying may have physical and psychological effects that may influence the outcome of the study, independent of any external (i.e., divine) aid prayer may bring. For instance, if someone prays to reduce their anxiety and their anxiety is eventually reduced, it is unclear whether the prayers are being answered by an external force or because the act of praying may be relaxing and healing in and of itself. For this reason, the physical act of praying needs to be controlled for in studies investigating the effects of prayer.

To gain a better understanding of how prayer works, a number of researchers have implemented intercessory prayer in their studies. Intercessory prayer is where one person,

instead of praying for themselves, prays for another person. The effects of the prayer are thereby studied on the other person. By using intercessory prayer, any potentially beneficial effects of prayer can be observed without risking the influence of potential benefits that occur from the act of praying. But this leads to another problem. It may also be the case that knowing you are being prayed for may have psychological and physiological effects as well.

A study by Matthews, Conti & Sireci (2001) demonstrates the influence that knowing one is prayed for can have. Matthews and colleagues performed a study that explored the effects of intercessory prayer, positive visualization, and expectancy on the health and well-being of critically ill patients. Ninety-five patients with end-stage renal disease who were receiving hemodialysis volunteered for the study. All participants were told they would be put into one of two groups. In one group, patients would receive intercessory prayer from a Christian prayer group. The other group would have a group of non-religious individuals positively visualizing the patients improving both psychologically and medically. In actuality, both of the groups were split into three groups, each receiving either intercessory prayer, positive visualization or nothing at all. Researchers hypothesized that the outcomes of patients receiving positive visualization and intercessory prayer would not differ from each other. They also hypothesized that the group expecting intercessory prayer would report more positive outcomes regardless of what treatment they actually received. Results showed those who expected to receive intercessory prayer did in fact report feeling significantly better than did those expecting to receive positive visualization, regardless of which treatment they received. Whether or not the patients received prayers, visualization, or no intercessory activity made no

difference in the measured medical or psychological variables between the three groups. The Matthews et.al. study demonstrates the need to keep the subjects unaware of whether they are being prayed for in order to eliminate expectancy effects and the possibility of a self-fulfilling prophecy.

In attempts to control for extraneous variables that exist when subjects are aware that prayers are being said for them, researchers have implemented blinding procedures into the designs of their studies. Studies using blind intercessory prayer intentionally keep the subjects unaware that they are being prayed for in an attempt to eliminate any psychological effects that may result from knowing one is being prayed for, such as a self-fulfilling prophecy. Additionally, if a researcher knows whether subjects were being prayed for or not, they may treat those subjects differently. For this reason, researchers often blind themselves as to who is being prayed for or not until the end of the study. Blinding the researchers and the subjects to exactly who is being prayed for helps to eliminate the effects of researcher bias and other extraneous variables that may affect the research outcome. The following studies all investigated the effects of intercessory prayer when either the subjects were unaware they were being prayed for or both the subjects and the researchers were unaware of who was prayed for, at least until the end of the study.

In 1965, Joyce and Welldon reported a study of the effects of intercessory prayer on 48 patients suffering from psychological or rheumatic diseases. The patients were loosely matched by sex, age, marital status, religion, and primary diagnosis. With the flip of a coin, one member of each pair was chosen for the experimental group and the other was assigned to the control group. Patients in the prayer group were prayed for over an

18-month period. Each patient in the experimental group received approximately 15 hours of prayer by the end of the study. Patients were unaware that they were being prayed for. The intercessors had no actual contact with the patients, but were given the first names and a picture of the person that they were to pray for. In addition, the researchers and physicians were not aware of which patients were being prayed for and which were not. The net change in health for prayed for subjects and for patients in the control group was observed. Patients prayed for did better than the control group in the first half of the study. However, in the second half of the study, the control group did better. Researchers concluded that intercessory prayer under these conditions does not promote healing.

The design of this study by Joyce and Welldon has fallen under some scrutiny. Petrowsky and Zellner (1996) criticize the experiment's imprecise matching procedures, small sample size, and poor manipulation of prayer. The matching procedures used produced 19 pairs of participants but only 3 actually matched on all five factors. In one case their matching procedures resulted in comparing an individual with a mental disorder with a patient who suffered from arthritis. The sample size was also criticized. Nineteen pairs was so small that statistical aberrations alone could have skewed the results. Additionally, the manipulation of prayer was not controlled for. Prayers were not offered consistently in terms of how many people were praying for the patients, when and how long they prayed, the intensity of the prayer and total duration of prayer.

In 1969, Collipp reported the results of a triple-blind study of the efficacy of distant intercessory prayer on 18 leukemic children. In this study, the participants, the researchers, and the doctors and nurses were unaware of who was prayed for until the

conclusion of the study. Collipp collected personal data on the children, including name, age, diagnosis, date of diagnosis, and later date of death if death occurred. In addition, monthly data from parents and physicians collected independently asked whether the illness, the child's adjustment, and the family's adjustment were better, unchanged, or worse. Of the 18 children in the study, 10 were randomly selected for prayer. Their names were sent to a research assistant who organized a prayer group. The group was told to pray daily for the children, but not told that the study was on the efficacy of prayer. After 15 months, seven of the 10 children prayed for were still alive, while only two of the eight who were not prayed for were living. Collipp concluded that his findings could be considered significant, he realized that his sample size was too small for the results to be generalized and therefore concluded no effect of prayer.

Collipp acknowledged additional methodological problems with the study. He noted that there was inadequate control of extraneous variables. In this case the random distribution of children into the group not prayed for included two children having acute myelogenous leukemia, which is much more malignant than acute lymphatic leukemia. None of the children prayed for had the more virulent form of the disease (Petrowsky and Zellner, 1996).

In 1988, Byrd published a study of the therapeutic effects of intercessory prayer on patients in a coronary care hospital unit (CCU). Over 10 months, 393 patients admitted to the CCU were randomly assigned to a prayer group (n=192 patients) or control group (n=201 patients), after being informed of the full nature of the study and signing an informed consent form. Each patient being prayed for had a group of three to seven intercessors praying for them daily. The intercessors were chosen based on being

“born again Christians” and who were already practicing an active Christian life which included both daily devotional prayer and active participation at a local church. The intercessors were instructed to pray for rapid recovery, prevention of complications and death, and any other prayers they believed would be beneficial. The hospital staff, doctors, patients and researchers did not know which patients were being prayed for until the end of the study.

At entry to the hospital, analysis revealed no meaningful difference between the two groups in terms of present problems and diagnoses. All patients had follow-up check ups for the remainder of the hospital stay. New problems, diagnoses, and new therapeutic interventions that occurred after entry into the study were recorded. Analysis after entry into the study revealed that the prayer group had significantly better outcome scores on six of the variables (out of 26 measured). They had less congestive heart failure, required less diuretic and antibiotic therapy, had fewer episodes of pneumonia, had fewer cardiac arrests, and were less frequently intubated and ventilated. In order to correct for the inflated probability caused by the large number of comparisons made, Byrd combined the outcome variables into an overall severity score and rated the patient’s hospital stay as either good, intermediate or bad. The results showed 85% of the prayer group had a rating of good versus 73% in the control group. An intermediate rating was given to 1% of the prayer group versus 5% of the control group and a bad rating was given to 14% of the prayer group versus 22% of the control group. Byrd concluded from these results that intercessory prayer to a Judeo-Christian God has a beneficial therapeutic effect in patients admitted to a coronary care unit.

Critics have pointed out that though Byrd found differences between those

patients prayed for and those not prayed for on 6 of the 26 variables, there were 20 other variables where there were no significant differences (Avalos, 1997; Petrowsky & Zellner, 1996). Fourteen of these variables favored the prayer group, but the differences were not significant. Nine variables showed no difference or slightly favored the control group. In particular, the number of days patients spent in the CCU, the number of days spent in the hospital and the number of deaths did not significantly differ between the prayed for and not prayed for patients. This is particularly interesting since two of the three specific outcomes prayed about for all patients were a rapid recovery and prevention of death (the third was prevention of complications; O'Mathuma, 1999).

In an attempt to replicate Byrd's study and correct some of its shortcomings, Harris et al. (1999) conducted a study to evaluate whether intercessory prayer had an effect on complications and the duration of hospital stay in CCU patients. The 990 CCU patients were randomly assigned by the hospital chaplain's secretary to a prayer group ($n=466$ patients) or a control group ($n=524$ patients) using the odd or even patient identification number given to subject at entry to the hospital. After a patient was assigned to the prayer group, intercessors were given the first name of the patient and instructed to pray for the health of the individual. Unlike Byrd's study, intercessors were not told of the subjects' health condition. It was a triple blind study. Subjects, doctors and researchers did not know who was in the control or experimental group until the conclusion of the study. Throughout the duration of the study, subjects were assessed on the severity of their health condition and the medical interventions required during hospitalization. When the subjects exited the hospital, the assessments were combined, which led to an overall CCU score. The mean CCU score for those in the prayer group

was 11% lower than that of the non-prayer group. The authors concluded that supplementary, remote, blinded, intercessory prayer produced a measurable improvement in the medical outcomes of critically ill patients in the CCU. The authors note that their findings would be expected to occur by chance alone only one out of 25 times, but chance still remains a possible explanation for the results. These findings are consistent with Byrd's assessment--that intercessory prayer lowered the scores that reflected a more complicated hospital course but did not significantly effect the length of stay.

Hammerschmidt (2000), Waterhouse (2000), and Smith and Fisher (2000) have questioned Harris' method of assigning patients to the control group or the experimental group according to patient's odd or even admission number. This method of assigning patients in this way was not random but rather systematic. The critics state that this method more often results in systematic bias. Calculation errors were also found which may have led to significant differences between the control group and the experimental group (Karis & Karis, 2000; Price, 2000). As well, Hammerschmidt (2000) noted that Harris used the t-test to compare results on a clinical outcome scale and such scale values are not normally ratio type numbers in their representation of clinical severity. He believes that one cannot, in a clinical sense, say that a unit increment in one portion of the scale in one patient means exactly the same thing as a unit increment in a different part of the scale or in a different patient. Considering the nature of the data, an alternative test that provides more robust results might have been employed. In addition, Goldstein (2000) and Hammerschmidt (2000) suggested that Harris and his colleagues may have made an ethical error when they bypassed any effort to obtain informed consent from the subjects. Harris justified this action by stating that there was "no known risk" to the

patient and that an informed consent inquiry could have in fact caused distress to the subjects considering their fragile state.

Kwang and colleagues (2001) performed a study that investigated the effects of blind intercessory prayer on in vitro fertilization success. Over a 4 month period, 219 women were treated with in vitro fertilization-embryo transfer at a hospital in Seoul, Korea. The women were randomly assigned to either control or intervention groups. Subjects in the intervention group unknowingly received intercessory prayer from individuals in Canada, The United States, and Australia. The IP group had a higher pregnancy rate than those in the control group (50% vs. 26%).

A study by Sicher, Targ, Moore and Smith (1990) investigated the effects of prayer in conjunction with a number of healing methods, which they termed “Distant Healing”. Distant Healing was defined as a conscious, dedicated act of meditation attempting to benefit another person's physical and/or emotional well-being at a distance. Forty volunteers with advanced AIDS were paired by age and randomly assigned to either receive distant healing or no healing. Forty healers were recruited from across the country and deriving from various religious backgrounds including Christianity, Buddhism, Judaism, Native American and other Shamanic traditions. All healers had at least 5 years experience, and all had experience with AIDS patients. After receiving a first name and photograph of 5 patients in the treatment group, the healers sent healing to the patients for an hour each day, six days a week for 10 weeks. Healers were randomly rotated weekly so that every patient had 10 different healers who sent healing over the course of the treatment. All patients received standard medical attention throughout the course of the study. Doctors and patients were unaware of who was being prayed for.

After six months, medical charts were reviewed and the two groups were compared on a number of health measures. Those who had healings sent to them had significantly fewer AIDS-related illnesses, lower severity of illness, fewer visits to the doctor, fewer hospitalizations, and fewer days in the hospital.

A related study on the use of prayer supports prayer effects and suggests valuable alternative applications. Klingbiel and Klingbiel (1993) designed a number of studies to test the power of prayer under controlled conditions. These prayer experiments utilized simple organisms such as yeast and seeds in order to limit the variables found in more complex human studies. In one study the researchers sprouted rye grass seeds in increasingly stressed conditions. They systematically increased the amount of stress on the seeds by adding salt to the water used to germinate the seeds. A piece of string was placed down the center of the tray used to germinate the seeds and divided the seeds into control and treated groups. The treated groups were treated with holy thought (prayer) from individuals who were instructed to pray for a specific group. Each trial included a few hundred seeds at a time so that initial and final counting of seeds was made easy. The experiment was repeated several times until the total amount of seeds in each group reached several thousand. Results of the first trial show a 2.3% increase in the number of germinated seeds in the prayed for group over the number of germinated seeds in the control group. As the stress on the seeds is increased, the percent increase of the number of germinated seeds in the prayed for group over the number of germinated seeds in control group increases to 400%, until the concentration of salt is too strong for any seeds to sprout. Similar tests were conducted using soy and mung beans and yeast, and concluded similar results.

Previous research on prayer has demonstrated that prayer can have an influencing effect on human behavior and in influencing physical and psychological outcome. In a number of these studies however, (e.g., Khouzam, 1996; Chan, 1995), the true cause of the positive outcome could as easily be attributed to a mind – body connection or expectancy because the subjects knew they were being prayed for. Additional studies have been performed that attempt to control for expectancy by implementing blinding procedures (e.g., Joyce and Welldon, 1965; Collipp, 1988, etc.). In these studies the subjects, researchers and anyone in direct contact with the subjects remained unaware of who was being prayed for until the conclusion of the study. In these studies, the pairing of subjects with intercessors was performed by a third party who had no actual contact with the subjects. For example, Byrd (1988) had the hospital Chaplain’s secretary perform the pairings. Studies using these blinding procedures have reported positive results suggesting that third party prayer can have a true and positive effect on outcomes. In addition, studies on non-human organisms (Klingbeil and Klingbeil, 1993) report significant results, which further supports a true effect occurring from intercessory prayer.

The current study stems from the above research and the assumption that intercessory prayer has a real effect on those prayed for. Its attempt is to better understand under which parameters and in which situations prayers’ effects can be observed and measured.

Hypothesis

A commonly shared belief in the efficacy of prayer, supported by scientific research, suggests that prayer can be effective in positively altering life events. Furthering

this assumption, it would stand that intercessory prayer could positively affect student performance, and more specifically, test scores of students if the students and their test grades were prayed for.

If intercessory prayer is applied to a number of students in a business class, specifically requesting high test scores, and if prayer has an effect, then the students should get better scores on the tests when they are prayed for, all else being equal. In addition, those students who are prayed for should also get better scores on tests when prayer is applied than students who are not prayed for. Using a 3 x 2 matched groups design with three college exams being the dependent measure, the present study will investigate if prayer has an effect on test scores. If prayer has an effect when the students and their scores are prayed for it should reveal itself when the test scores are averaged.

Using three different tests as the dependent measure will also allow the researchers to determine if prayer in this situation has any carry over effect. There is a possibility that prayer has a carry over effect on the test grades. In the case of certain prescription medication, it sometimes takes up to a month before it works itself out of the body and side effects may be felt during that time. Prayer may work in a similar way. Students may be prayed for on one test and prayer's effects may carry over and positively affect the scores on the following test. In this investigation, there are two possible outcomes if prayers effects are discovered. The first is that the prayers have no carry over effect on the test scores.

As depicted in Figure 1, students in group A are prayed for and perform better on test 2 than they did on test 1, which was a baseline measure. But once prayer was removed following test 2 the students perform at their usual level, similar to test 1. In

this case, the scores on test 3 were unaffected by the prayers for test 2. On the other hand,

Figure 1

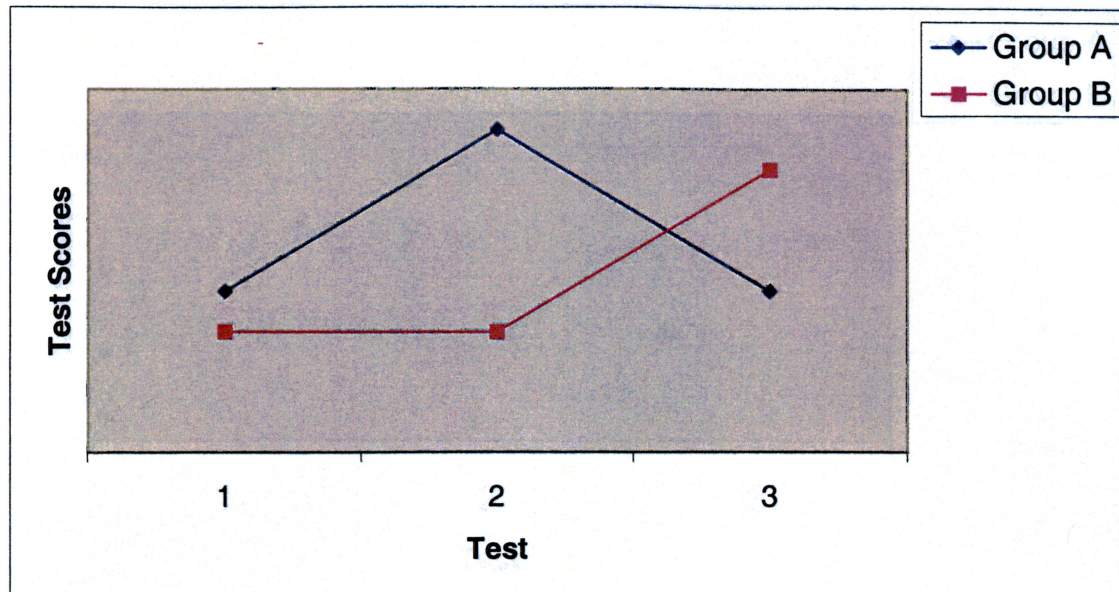


Figure 1. Hypothesized effect of prayer on grades with no carry over effect. Students in group A are prayed for and perform better on test two than on test one. Test scores on test 3 drop back down to baseline level after prayer is discontinued following test 2

if prayer does have a carry over effect, than students in group A should perform better than baseline on test 3 as well.

In this situation, prayer's effects carry over from test 2 which positively influences the student's scores on test 3.

Method

Students

A total of 104 undergraduate students between the ages of 19 and 36 (median = 20.4) participated in the study. The 53 males and 51 females were all enrolled in a

junior/senior level university business class.

(Figure 2).

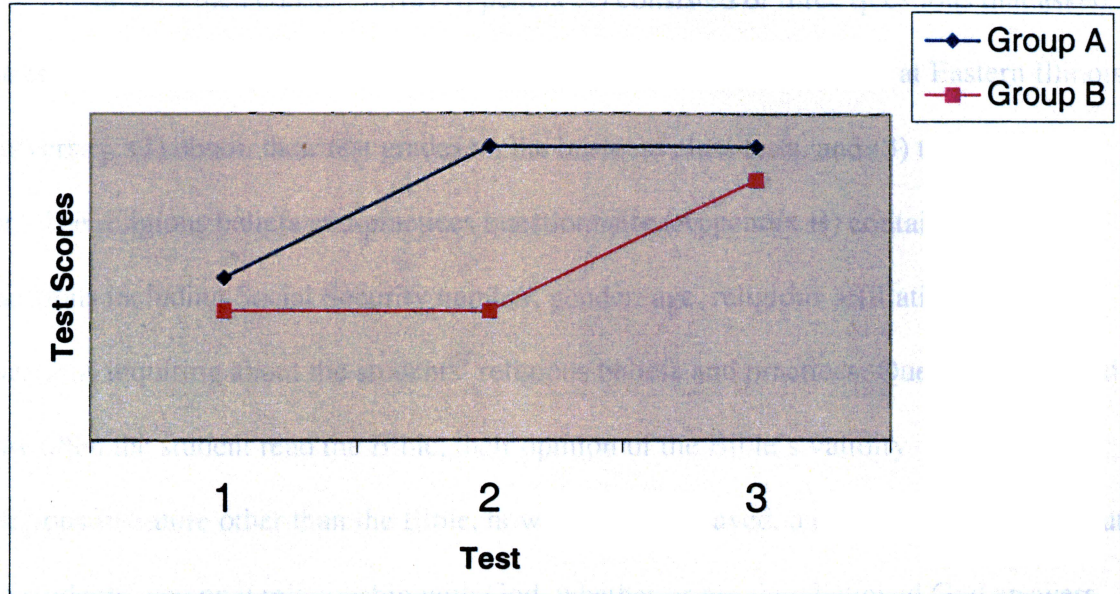


Figure 2. Hypothesized effect of prayer on grades with carry over effect. Students in group A are prayed for and perform better on test 2 than on test 1. Test scores on test 3 remain elevated for group A because of a carry over effect from the prayers spoken for test 2 scores.

Intercessors

Researchers invited all regular attendees of a Methodist Church in Charleston IL to participate in a study involving prayer. After the study was explained to them, 63 attendees volunteered to participate as intercessors (those who did the praying) in the study. The intercessors were of Christian faith and regular church attendees.

Materials

Materials for this study include an informed consent form, a questionnaire of

religious beliefs and practices, an instruction sheet for the intercessors containing details of when and how long to pray, a suggested prayer for the intercessors to pray and a log sheet for the intercessors to document when and how long they prayed.

The informed consent form (Appendix A) consisted of three questions that asked the students for their permission to (1) access their current overall GPA at Eastern Illinois University, (2) obtain their test grades on the business class tests, and (3) to be prayed for. The religious beliefs and practices questionnaire (Appendix B) contained 12 questions including Social Security number, gender, age, religious affiliation and questions inquiring about the students' religious beliefs and practices. Questions inquired how often the student read the Bible, their opinion of the Bible's validity, if they read religious literature other than the Bible, how often they prayed, a question inquiring about the students' personal relationship with God, whether or not they believed God answers prayer, how often they have had religious or spiritual experiences and how often they attend religious services.

Procedure

One hundred and twenty nine students from the junior/senior level business class entitled "Principles of Marketing" were asked to participate in a study that investigated the relationship between religious beliefs and student performance. The students were asked if they would assist this researcher by completing the questionnaire of religious beliefs and practices. Students were told that their answers would then be compared with their performance in the class. It was explained to the students that it was therefore essential for the students to provide consent for this researcher to access their current overall GPA and grades on the class tests. Students were also asked whether they had

any objections to being prayed for. However, they were not given any information about when, or even if, they would be prayed for. Students were asked to provide consent for each of these three elements of the study, access to GPA, access to Test Grades, and consent to be or not be prayed for. Students who did not give consent for all three elements were excluded from the study (N=25). A total of 104 students (80%) gave consent on all three elements of the study. In addition, it was explained to the students that participation was optional and that they would not be penalized if they did not wish to participate in the study.

Once consent was obtained, overall GPAs for the students were obtained from the university records office. A list was created of the students, based on GPA, in descending order from highest to lowest. The first two names constituted the first pair, the second two made the second pair, then the next two, and so on. Next, each pair member was assigned, by the flip of a coin, to one of the two groups. Once the first pair member was assigned to a group, the other pair member was assigned to the alternate group. Students who had no GPA (N=5), such as transfer students, were excluded from the final analysis.

Three tests administered in the business class were the dependent variables. The first test of the semester was used as a baseline. After the first test was administered, each student in group A was randomly assigned to the intercessors to be prayed for. Each student had 3 to 5 intercessors praying for them. This procedure of assigning names was done with the help of a third party to ensure that the researcher remained unaware of who was and who was not being prayed for.

The intercessors were given a packet with the student's first names and last initial, an example of a suggested prayer, instructions on when to pray and when to stop praying,

and a log sheet to record the length and date of the prayers (Appendix C). Intercessors were asked to begin praying for their assigned students from group A immediately following the administration of the first test and to stop praying after the second test was administered. Prayer for group A lasted for a total of 4 weeks. After the 4 weeks was up, the procedure was repeated with students in group B. Intercessors received the names and began praying for their assigned students from group B following the administration of the second test, up until test three was administered. Prayer for group B also lasted for 4 weeks. Test scores of students who participated were obtained from the instructor 1 week after each tests was administered.

Results

Of the 104 students who completed the informed consent form to participate in the experiment, 5 were excluded from the final analysis because they had not attained a current GPA (or current academic standing), 4 were excluded because they or their pair did not take one or more of the three required exams, and 1 was excluded because he/she did not have a pair after the above 9 were excluded. This left 47 pairs of students (N=94) for the final analysis.

The students consisted of 49 males and 45 females ranging in age of 19 to 28 (M=21). The students GPA's ranged from 4.0 – 1.9 (M=2.94). Students reported a variety of religious backgrounds including Roman Catholic (N=37), Lutheran (10), Methodist (9), Baptist (6), Presbyterian (4), other Christian (23), and other non-Christian religions (4). One student had no response to the question of religion.

The first concern was to determine if the intercessory prayers had an effect on the exam scores. A 3 X 2 (Test X Group) analysis of variance (ANOVA) on test scores was

conducted. Results indicate that there is no significant 2 way interaction between the tests (i.e., when the students were in baseline, prayer, or no prayer), and group, $F(2,6) = .018$ $p > .05$. There was no significant main effect of test on the test scores, $F(2,6) = .862$ $p > .05$. There was also no significant main effect of group on test scores, $F(1,6) = .913$ $p > .05$. Therefore, it is not confirmed that students perform better when unknowingly prayed for with intercessory prayer. At this point, because no significant effect of prayer on student performance was discovered, researchers concluded no carry over effect. The test averages of each test are exhibited in Figure 3.

Figure 3

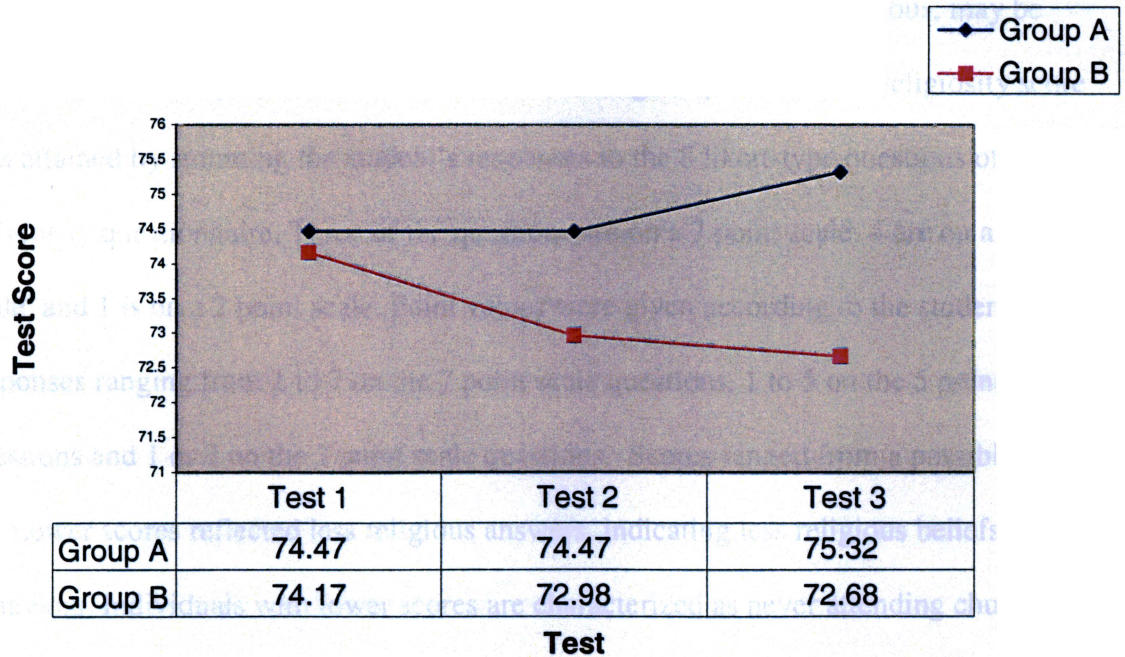


Figure 3. Actual test scores revealing no effect of intercessory prayer on test results.

In addition, it was of interest to confirm that the groups were equal in ability. A difference in performance ability between the two groups could have an influence on the

test scores and determining the true effect of prayer. This was accomplished by comparing the two groups' scores on the baseline measure. Results of a t-test for dependent means indicates that students in group A performed no differently than students in group B on the baseline measure ($M = 74.47$ and $M = 74.17$, respectively), $t(47) = .13$, $p > .05$. There is no reason to assume that there is any difference in performance ability between the two groups. A comparison of group A and Group B's overall GPA was also performed. Results of a t-test for dependent means indicates that there is no significant difference between overall GPA between group A ($M = 2.95$) and students in group B ($M = 2.94$), $t(47) = .0027$, $p > .05$.

It was also of interest to confirm that the groups had relatively equal religiosity scores. Students who are more religious, versus those who are less religious, may be more responsive to prayers because of their own religiosity. An overall religiosity score was attained by summing the student's responses to the 8 likert-type questions of the religiosity questionnaire. Three of the questions are on a 7 point scale, 4 are on a 5 point scale, and 1 is on a 2 point scale. Point values were given according to the students' responses ranging from 1 to 7 on the 7 point scale questions, 1 to 5 on the 5 point scale questions and 1 or 2 on the 2 point scale questions. Scores ranged from a possible 8 to 43. Lower scores reflected less religious answers, indicating less religious beliefs and behaviors. Individuals with lower scores are characterized as never attending church, never praying, and holding a belief that God does not answer prayers. Higher scores reflected more religious answers, indicating stronger religious beliefs and increased religious practices. Individuals with higher religiosity scores are characterized as regularly attending church services, reading the bible several times a week, and praying

daily etc. The religiosity questionnaire used has not been tested for its internal validity but has strong face validity.

Religiosity scores of the students in the study varied from 11 to 41 ($M=22.57$). Results of a t-test for independent means indicates that students in group A and group B did not differ significantly in their religiosity scores ($M = 22.17$ and $M = 24.26$, respectively), $t(87) = 1.50$, $p > .05$.

Discussion

No significant differences were found between student test scores when the students were prayed for than when not prayed for. When students were unknowingly prayed for daily for four weeks, they did not have higher test scores than when they were not prayed for. There are a number of possible explanations for this. Intercessory prayer may simply not have any effect when the person being prayed for is unaware of it. However, this explanation is not consistent with the findings of Kwang and colleagues (2001), Harris, (1999), and Byrd, (1988). It is possible that intercessory prayer only has an observable effect on physical processes, processes that are out of the subject's immediate control. In Harris, Kwang, and Byrd, the effects of prayer were tested on in vitro fertilization and health outcomes. In these cases, the natural outcomes are due in large part, if not completely, to extrinsic variables or variables outside the control of the individual. In other words, the individual could not consciously study harder to get pregnant or become well. In these studies prayer had an effect. In the present study, the outcomes of the study (grade), is strongly influenced by conscious behaviors on the part of the student. Prayer could have had an effect but the students' study time and class attendance could have overshadowed any effects of prayer. Therefore, it may be that

prayer has a more observable effect on processes that are less dependent on conscious behaviors. Intercessory prayer may work better on outcomes when the recipient has less control over the outcome. Future studies investigating the effects of intercessory prayer with human subjects may wish to apply prayer to variables that remain outside the subject's immediate control.

Another possible reason for the non-significant results could be due to uncontrolled variability of prayer. Prayer may have been inconsistently applied. It is possible that the task of praying for 10 minutes a day was unreasonable and too laborious for the intercessors to complete. They may have reported praying 10 minutes but in actuality prayed less and/or did not pray daily. Also, intercessors may have prayed silently instead of verbally, despite being given the suggested spoken prayer format to pray. In addition, the amount of prayer used in the study may not have been enough to elicit observable results. It may be that 10 minutes of daily prayer is not enough prayer to influence the test results. Perhaps a higher dose of prayer, say 20 minutes, or 30 minutes is needed to observe an effect. Also, a longer duration of prayer may have been needed. Prayer was prescribed for only 4 weeks. Perhaps 6, 8 or 10 weeks may have been needed for results to be observed. For instance, some medications need to be in the bodies various systems for a month or longer before any effects can be observed. Future researcher would benefit from controlling specifically when, how, and for how long prayer is applied. Future studies may also wish to vary the amount of days over which prayer is spoken in addition to the total amount of prayer spoken for the subjects of the study.

Furthermore, the effects may have not been observed because the prayers may

have had delayed effects that were not measured due to the structure of the study. The Bible suggests that no answer to prayer may in fact be a delayed answer (Daniel 10:12-13). The students may not have performed any better on the tests when they were prayed for but long term effects may result. They may perform better on tests in the upcoming semesters because of the prayers spoken for them in this study. Future studies may wish to apply prayer to variables that have a longer maturation time, or study prayer over a longer time span than the 4 week intervals used in the present study.

One additional possible reason prayer did not have observable effects could be due to vagueness of the instructions provided to the intercessors, specifically the suggested prayer. Intercessors were instructed to pray for student success on the test. Student success could mean numerous things such as simply completing the test or following test rules. More precise instructions could have been given to the intercessors in praying for the students. Intercessors could have been instructed to pray for A grades.

Although no significant effect of prayer was discovered in this study, future researchers now know that prayer does not appear to have an effect with the conditions used in the present study. Some suggestions have been offered based on the conclusions of this study and previous research and if applied to future research, the mystery of when and how prayer works may be discovered.

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Appendix A

Informed Consent Form

This is a study of the relationship between prayer and student success in a college class. It is believed that being prayed for can have positive physiological and psychological effects. Your willing consent to participate in this study will subject you to the possibility that individuals from this community may pray for your success in this class. Because of the design of the study, we will need to access your current GPA and your test grades from this class. Be assured that your confidentiality will be protected in any reports of this research. Names, grades and GPA will not be released to anyone and will be kept in a secure environment throughout the duration of the study. Participation in this study is completely voluntary; you may quit at any time during the research and you will not be penalized for nonparticipation. Thank you for your willing participations. Your signature indicates that understanding and willingness to participate.

I give consent to:

(Circle)

.....Be prayer for	Yes	No
.....Have the researchers access my records to obtain my GPA	Yes	No
.....Have my instructor report my grades in this class to the researcher.	Yes	No

Name_____

Date_____

Signature:_____

ID#_____

Appendix B

What is your gender? Male Female SS# _____

What is your age? _____

What is your religious affiliation?

Roman Catholic Orthodox Methodist Presbyterian Other Christian
 Baptist Lutheran Episcopalian Jewish Other: _____

Listed below are six statements about the bible. Indicate which statement is closest to your own view by checking the box next to that statement.

- The Bible was written by men long ago so it is worth very little today.
 The Bible is a good book written by wise men, but God has no input.
 The Bible was written by men and inspired by men, but it contains some errors.
 All Bible stories reflect God's word, but some may not have occurred.
 The Bible is God's word and all the events in it are literally true.

HOW OFTEN DO YOU READ THE BIBLE?

- Never About once or twice a year Several times a year
 About once a month Two or three times a month Nearly every week
 Several times a week

How often do you read religious literature other than the Bible?

- Never About once or twice a year Several times a year
 About once a month Two or three times a month Nearly every week
 Several times a week

How often do you pray?

- Never About once or twice a year Several times a year
 About once a month Two or three times a month Nearly every week
 Several times a week

To what extent do you have a personal, unique, close relationship with God?

- Not at all Slight Moderate Strong Very Strong

Do you believe that God answers prayers?

- Yes No

Do you have experiences where you reel a union with God and gain spiritual truth?

- Never Rarely Occasionally Often Quite Often

How frequently do you attend religious services?

- Never Rarely Occasionally Often Quite Often

Appendix C

Dear intercessors,

Here is a suggested prayer for you to pray for the College students. They have a test coming up in their business class and we ask that you pray for their success on that test. Here is a sample prayer that you can use: “Dear Heavenly Father, we pray that you hear our prayer. Please look over _____. They have a test coming up soon in their business class and we pray for their success on that test.”

Of course you should feel free to expand upon this prayer if you are moved to do so. I ask that you pray at least once a day for each person on your list.

Thank you for your help,

Christopher Clark