Effects of Encouragement on Cognitive Performance of an Abstract Reasoning Task

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HIGHLIGHTS

- Encouragement interventions enhanced employee abstract reasoning performance.
- Verbal and non-verbal cues were equally effective in boosting task outcomes.
- Encouragement improved cognitive scores by up to 15 points over no support.
- Gender was not a moderating factor in cognitive gains from encouragement.
- Contextualises motivation research within a South Asian organisational setting.

ABSTRACT

Encouragement is a widely acknowledged motivational strategy with significant potential across various life domains. However, its specific impact within organisational contexts, particularly in culturally distinct settings such as the Maldives, remains relatively unexplored. This study aims to address this gap by investigating the varying effects of verbal and non-verbal encouragement on cognitive performance in the workplace. Drawing on Albert Bandura's self-efficacy theory and other foundational motivation theories, this research seeks to elucidate how different forms of encouragement interact with individual cognitive processes to enhance performance outcomes. Participants were recruited from a public limited company in the Maldives through convenient sampling, with all employees invited to register voluntarily. They were then randomly assigned to one of three experimental conditions: verbal encouragement, non-verbal encouragement, or no encouragement. Cognitive performance was assessed using the Raven's Progressive Matrices test, a standardised tool for measuring non-verbal reasoning and abstract thinking, administered under controlled conditions with a uniform 10-minute time constraint. The study found that both verbal encouragement and non-verbal encouragement significantly improved performance when compared to no encouragement conditions in the reasoning task. Interestingly, there was no significant difference in performance scores between the verbal and non-verbal encouragement groups, although both outperformed the control group. Additionally, gender did not seem to influence performance scores. While the study's theoretical contextualization could have been more explicit, its empirical findings offer valuable insights into the practical implications of encouragement in organisational settings. By highlighting the differing effects of verbal and non-verbal encouragement on cognitive performance, this research contributes to a deeper understanding of motivational dynamics in the workplace. Moreover, it underscores the potential for leveraging encouragement as a tool to enhance employee performance and well-being. The study also emphasises the need for further research to develop measurement tools for encouragement and raise awareness on its significance in organisational contexts.

KEYWORDS

Encouragement
Cognitive Performance
Social Support
Motivation
Employee Performance

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INTRODUCTION

Encouragement is commonly used across all ages and social settings, offering support for one another, in both everyday activities and in the pursuit of significant life goals (Horvath et al., 2011). During times of uncertainty and low confidence, encouragement serves as a motivational strategy to help individuals realise their true potential (Beets et al., 2010). Empirical studies on this topic demonstrate that encouragement significantly enhances performance, as it entails embracing human strength, and can be viewed as a source of internal motivation (Sahli et al., 2022). Even in non-critical situations, colloquial expressions like "you have the potential" and "you can do this" can inspire the person to perform better and try harder. Therefore, as a widely accessible and low-cost motivational strategy, the findings of this line of research can be applied to improve the quality of life and prosperity for both individuals and organisations.

Despite the practical relevance of encouragement, it was observed that research and attention paid to it in many disciplines of study appeared to be fairly dispersed and inconsistent (Wong, 2015). According to Wong (2015), in his paper published on this topic, there has not been any attempt to assess, categorise or combine these various streams of scholarly work into a single overarching conceptual framework of encouragement. Furthermore, Wong (2015) expressed concern that despite the recent publication of several handbooks on positive psychology, none of them contained a chapter on encouragement. However, Alfred Adler, who is regarded as being the first psychologist to formally study this subject presented an analysis of the psychology of encouragement in 1956 (Wong, 2015). He postulated that it is a crucial aspect of human growth and psychotherapeutic care, and viewed it as the most crucial component of getting along with others (Wong, 2015). This served as the preliminary step for Wong (2015) to create a more comprehensive and all-encompassing definition of encouragement as the "expression of affirmation through language or other symbolic representations to instil courage, perseverance, confidence, inspiration, and hope to tackle challenging situations or realise one's true potential" (p. 182). This definition can be viewed as an all-inclusive definition as it expands to encompass "language and other symbolic means," which could refer to verbal or non-verbal forms of communication. It becomes even more exclusive with "difficult events or attaining genuine potential," which turns encouragement into a more specific kind of communication. Therefore, for the remainder of this paper, encouragement will be defined following Wong's definition.

While Wong (2015) and a few other researchers have studied the subject over the years (e.g., Kelly, 2002; Roberts et al., 2015; Xia et al., 2019), their work cannot be deemed sufficient given the importance of this subject in relation to a number of disciplines, including organisational development, education, marital satisfaction, leadership abilities, pain management and treatment, parental and family sciences, performance in various areas, religion, and many more. Therefore, this paper aims to investigate the effects of encouragement on cognitive performance which can be applied directly and indirectly to aforementioned areas and others as well.

REVIEW OF LITERATURE

Social Support and Interpersonal Relationships in Interpersonal Encouragement

Interpersonal encouragement has been a subject of research on social support (SS) literature, as it is an effective type of SS and emotional support, particularly to help drive people to accomplish things they do not like (Kratz et al., 2013 as cited in Wong, 2015). According to Wills, (1991, as cited in Jiang et al., 2018), SS is defined as the sense or experience of feeling valued or appreciated, loved or cared for, or as a part of a network of reciprocal obligations. The key themes of SS literature are mostly focused on physiological outcomes and health psychology.

According to the results of an assessment of 81 studies by Uchino et al. (1996), SS had favourable effects on distress brought on by the immunological, endocrine, and cardiovascular systems. Similarly, Kelly (2002) investigated the impact of interpersonal encouragement on how students viewed their teachers' favourability through their actions of encouragement and praise. The study's findings revealed that the students preferred the teachers' use of encouragement above their use of praise. Additionally, they also found that the students' desire for encouragement, particularly among girls, was linked to their internal locus of control. In a 1964 study by Egbert et al., participants who were prepared for surgery that would result in some degree of postoperative discomfort for the subjects were chosen as subjects to examine the effects of encouragement on the reduction of postoperative pain and narcotic use. The experimental group was informed of pain and received verbal support in the form of "enthusiasm and confidence" to help them manage it. The control group received no coaching or information about the pain. It was found that the experimental group required half as few narcotics to treat their pain, and they were discharge-ready 2.7 days quicker than the control group. The results demonstrated how encouragement could lessen physiologic discomfort and pain. Even though this was a relatively modest form of

encouragement, it had positive effects on the participants and fits Wong (2015)'s definition of encouragement. Therefore, it may be assumed that offering people who are experiencing stressful situations comparable forms of encouragement as social support can improve their mood which can improve their performance.

Non-Verbal Encouragement on Performance

Non-verbal encouragement (non-VE), according to Guéguen (2004), entails the expression of support for one another by non-verbal cues such as touching, nodding, smiling, and eye contact. The study by Guéguen (2004) concentrated on non-VE of student involvement in a course where forearm touching by teachers was used as a factor to create encouragement. The study observed that non-VE significantly influenced the development of the desired behaviour. Hence, according to Guéguen (2004), non-verbal cues that establish familiarity, demonstrate hierarchy (of teachers), and elevate mood could be the basis of this effect. Furlich (2016), on the other hand, looked at the impacts of verbal and non-verbal teacher encouragement on students' motivation by measuring the relationships between the instructor's non-verbal encouragement and verbal encouragement behaviours on students' motivation. It was found that verbal encouragement increased students' desire to learn, whereas non-verbal immediacy had no such effect.

Verbal Encouragement on Performance

According to Albert Bandura's (1997) seminal theory on self-efficacy, verbal persuasion is one of the four sources of self-efficacy, where it is described as what other people say about their beliefs on what people can or cannot do, reinforces or weakens their beliefs about their capabilities. Wong (2015) points out that although Bandura operationalised it as positive persuasion, the true meaning of the reference is made to encouragement, which can be both positive and negative. Based on Bandura's theory, Wong (2015), proposed three factors that affect the effectiveness of verbal encouragement. The first factor is to frame the encouragement message correctly. According to Wong (2015), the first factor is that the message should foster self-efficacy when communicating progress (e.g., "you have finished 90% of the test, I know you can do the rest in no time") instead of focusing on the shortfall of the goal. Therefore, the message should include process-oriented factors such as strategy (e.g., "I love how you are using your fingers to do the math; keep doing that!"), attitude (e.g., "I know you will succeed because you are not a quitter"), as well as instil courage, hope, and confidence. The second factor is making sure that the encourager is perceived to be trustworthy by the receiver. This means the message should be coming from someone who is an authority figure (e.g., teacher, mother, work supervisor, etc.) or the encourager to be someone whom the recipient is comfortable with or knows well. The third factor is that the message to be credible, and it should not be unrealistic or overly effusive in praise.

A study by Luzzo & Taylor (1993) confirmed that students who received verbal encouragement had better self-efficacy in making career decisions than those who did not receive verbal encouragement. Results indicated that those who received verbal encouragement had better self-efficacy in making career decisions than those students who did not receive it. Similarly, research by Brownlow et al. (2011) found that both males and females who got VE from their peers outperformed the no-encouragement group on tasks requiring mental rotation. It was observed that receiving VE increased the participants' effort and confidence. This implies that increased effort and confidence brought on by encouragement may be the causes of improved performance.

Roberts et al. (2015) also looked at the effectiveness of verbal SS, non-verbal support, and being alone in three different settings for a cold pressor task (CPT) to attenuate stress and pain. Cardiovascular measurements, cortisol levels, and subjective evaluations were used to assess the individuals' reactions. A female confederate was present during the experiment for both the verbal and non-verbal groups, and the verbal group received scripted affirmations such as "You're doing great" as well as other similar phrases. The confederate was present for the non-verbal group for support, whereas the alone group just had the experimenter present. It was found that the group that got verbal SS displayed both favourable physiological and psychological responses, such as an annulated heart rate and a decrease in pain perception, compared to the other two groups. This suggests that while merely being there cannot guarantee the greatest outcomes, the vocal aspect of encouragement does have a substantial influence on performance.

Moreover, a study by Xia et al. (2019) examined the impact of parental encouragement on children's motivation to read among 254 primary school students in China who completed the Reading Self-Concept Scale, Parents' Encouragement of Extracurricular Reading Questionnaire, and Pupil Reading Motivation Scale. It was found that children's motivation to read was directly influenced by parental encouragement. They also found that the direct effect of parental encouragement on reading motivation was higher for boys than for girls.

Similarly, in a recent study, Sahli et al. (2022) examined the effects of verbal encouragement (VE) and compliments on physical performance by comparing

two experimental groups; one receiving encouragement and the other receiving praise, against a control group that received no treatment. They all underwent identical repeated change-of-direction (RCOD) sprint tests with the same investigators present, and the VE group received encouragement phrases like "don't give up," while the compliments group received expressions like "you are the best." While both compliments and VE were found to boost the performance of the experimental groups when compared with the performance of the control group, VE was found to be more helpful in achieving optimal performance than compliments. This could be because encouragement focuses more on effort and process, which aligns with Bandura's emphasis on self-efficacy as rooted in belief in one's capability to perform tasks. Compliments, on the other hand, often centre on personal traits, which may not foster sustained motivation or task engagement in the same way. Therefore, encouragement may have stronger theoretical links to goal-setting and intrinsic motivation, making it more effective in performance-oriented contexts. Additionally, VE was also found to motivate the subjects to intensify and sustain their workout efforts.

Overall, the reviewed literature demonstrates that encouragement can be in both verbal and non-verbal forms and can be considered as a form of social support that influences interpersonal relationships. It was also observed that encouragement can have positive effects in social support and in developing favourable interpersonal relationships. As such, encouragement was shown to have a stronger effect in enhancing favourability towards one another than praise (Kelly, 2002), although many people believe that praise would promote favourability in most situations as opposed to being sincere and encouraging. In a similar vein, encouraging people via social support at trying times like surgery was shown to help manage physiological pain (Egbert et al. 1964), suggesting the strength of encouragement at both physiological and psychological levels. On the other hand, it was observed from the reviewed literature that non-VE also has similar effects, and that non-VE cues can help students at school to express desired positive behaviours (Guéguen, 2004). However, it was also shown that VE greatly outperformed non-VE in terms of having favourable impacts on performance (e.g., Furlich, 2016; Roberts et al., 2015). Positive effects of verbal encouragement were observed in areas like education (Luzzo & Taylor, 1993), peer performance (Brownlow et al., 2011), stress management (Roberts et al., 2015), parenting (Xia et al., 2019) and physical performance (Sahli et al., 2022). However, there are still numerous facets of the research domains, as well as many other areas in general, that are not covered in the current literature as it is. As a result, the current study will contribute to understanding of how encouragement affects cognitive performance in an organisational setting, one of the domains where there is a scarcity of literature on the subject. Exploring this topic in an organisational setting can be extremely beneficial for organisations in motivating employees to perform better, especially in those areas that require expansive cognitive focus. The results may be applied to the present structure at organisations, and work processes as well as sectors outside of an organisational setting, such as education, parenting, sports, etc.

The reviewed literature does not show any research done on encouragement in an organisational setting, or any encouragement research that was done in the Maldives. This is a significant gap, as organisational settings may differ from educational or clinical settings in several ways, including the nature of task demands, hierarchical structures, and motivational climates. Unlike classrooms or therapeutic environments where encouragement is often embedded within developmental or supportive relationships, organisational environments may prioritize productivity, efficiency, and performance outcomes, potentially altering how verbal encouragement is perceived and received. For instance, employees may view encouragement through the lens of performance appraisal or management expectations, which could influence its impact on motivation and cognitive engagement. Gaps in the literature can be attributed to the fact that there has been a shortage of study and reviews on this subject generally.

Therefore, based on the direction of the reviewed literature and the lack of studies in the aforementioned context, the current study's goal is to examine the effects of encouragement on cognitive performance in the workplace. The main research question is whether encouragement can affect cognitive performance when solving an abstract reasoning task. With regard to performing abstract reasoning tasks, this study predicted that VE will significantly improve performance in solving an abstract reasoning task when compared to providing non-VE and no encouragement. Therefore, the study explored this using convenient sampling in an organisational setting to draw study subjects, as it was more practical considering the limited time and resources. To measure cognitive performance, an abstract reasoning task that required participants to respond to most questions within a given time frame was used. Selecting this task for the experiment was inspired by Arguel et al. (2019)'s study, where the researchers adopted a similar puzzle-solving activity to quantify confusion, where participants were given 10 minutes to solve as many puzzles as they could. A preliminary version of the current study was conducted for each condition among

two individuals who did not take part in the actual study.

METHOD

Design

The experiment was conducted in a meeting room at a public limited company in the Maldives and was conducted as a between-subject, post-test only, true experimental design, as the participants were randomly assigned to the three groups. Encouragement, which consists of two levels (verbal, non-verbal, and no encouragement) was measured as the independent variable (IV), and performance as measured in the abstract reasoning task was the dependent variable (DV). Gender distribution (two levels; male and female) across groups were also checked for approximate equality to improve external validity. This method of design was used in order to assess performance at various degrees of encouragement, which determined whether there was a cause-and-effect relationship between the two variables, and to enable effectiveness in addressing the research topic. The participants were given a box that contained 33 pieces of paper, evenly distributed among three groups in three colours (Blue for verbal encouragement, Red for non-verbal encouragement, and Yellow for no encouragement). Each participant was instructed to draw one piece of paper from the box, which determined which condition he/she would be put into. As mentioned earlier, each participant was put into one condition of the independent variable for the research. All the participants were given the same briefing before the test and the same debriefing at the end. However, rapport building was done for both verbal encouragement (VE), and non-verbal encouragement (NVE) conditions as part of IV manipulation.

During the experiment, the reduction of extraneous and confounding variables was given careful consideration to eliminate the possibility of inaccurate conclusions. As such, the experiments were conducted during mid-afternoon (12:00 pm to 2:00 pm) to create identical conditions for all participants. Additionally, the timing was also chosen based on a review of multiple studies by Barnes (2015), which indicated that a person's productivity peaks a few hours after commencing work, typically around 11:00 am, and then drops after 2:00 pm. Therefore, since the selected organisation's break time also falls within these hours (12:00 to 2:00), it was determined that this was the most ideal time to conduct the study without interfering with the schedules of the participants. Similarly, participants from all conditions were given the same amount of time (10 minutes) to complete as many problems as they could to avoid any time biases. Additionally, similar to the work by Roberts et al. (2015), all participants in the current study were paired with the same female confederate, who was present in all conditions to prevent bias and to reduce the possibility of disparities in encouraging (facial expressions and voice tones) and building rapport.

Participants

A Viber message was sent to all 53 employees who were employed in an administrative division of a local public limited company, inviting them to participate in the current study. A deadline of five days was given to register, where interested employees were instructed to fill out a Google form that was linked to the Viber message. The message also contained information on the study incentive, which was two pizza vouchers that were given to two lucky participants when the test was completed. This encouraged a total of 37 forms, of which four were later eliminated due to conflicts in their schedule. After finalising the participant list, the selected participants were informed via phone calls that they would be contacted during lunch hours (12:00-2:00 pm) to take part in the experiment. The finalised thirty-three employees were randomly assigned to three groups during the days of the experiment to take part in the abstract reasoning task. The first group received verbal encouragement, the second group received non-verbal encouragement, and the third group did not receive any encouragement during the task. The target age group for the subjects were between 18 to 65 years of age, however, all participants who participated were below 37 years of age (Age: M= 27.94, SD=4.821). The gender ratio between males and females was close to 1:1, as there were 17 males and 16 females. Even though a certain level of education was not specified as a requirement for participation, it was assumed that everyone working in the targeted department of the organisation that was selected would have the basic knowledge needed to understand the given abstract reasoning problems, especially since there is no set age range for administering RPM as it is a non-verbal reasoning test (Leavitt, 2011).

Material

Performance Measured by Abstract Reasoning Task. Before conducting the real experiment, a preliminary study was conducted among six volunteers (two for each condition) from the same organisation to see whether the flow of the experiment was correct. During this time, it was realised that the reasoning test that was previously chosen for the experiment was not ideal as the majority of the participants from the preliminary study found it to be too difficult which resulted in boredom and refusal to continue.

Hence, it was decided to change the reasoning task to something that an average person can perform without being bored so easily. Therefore, Raven's Progressive Matrices (RPM) was chosen based on the feedback of the preliminary participants. The RPM test was developed by John Raven in 1934 and is one of the most researched mental ability tests that measure a person's non-verbal reasoning, abstract reasoning, and cognitive functioning. Due to its wide application and the fact that it is entirely visual, which removes any potential language barriers, this non-verbal test has been used by people of various ethnicities for a long time (Leavitt, 2011). In RPM, when performing the test, examinees must decide whether a presented design is consistent with the rule or infer a rule to create the subsequent items in a sequence as part of the test (Leavitt, 2011). The test-related information is built upon this concept as the items get progressively harder. Therefore, the test can assess the learning as well as the reasoning abilities of an individual (Leavitt, 2011). While RPM consists of 60 questions broken down into five subparts, the examinees can proceed at their own pace without being interrupted. It usually takes 40 minutes to one hour for an individual to complete the test; however, to save time for the current experiment, the participants were allowed only 10 minutes to complete as many questions as they could. Additionally, the maximum score for this test is 60, which is converted to a percentile to determine a person's intelligence score (IQ), even though this computation was eliminated from the results because the objective of the current experiment was not to find the participant's IQ. Instead, the number of accurate responses they provided within the allotted time frame was what determined their score for the current study. The participants received printed copies of the RPM question paper, and the confederate took note of the answers when the participant pointed out the response they chose for each question. The participants were told to either point at the correct response or say the appropriate choice number while pointing to the questionnaire.

Procedure. All participants were invited individually to the same meeting room for three weeks to take part in the experiment. Even though it took a lot of time for data collection, each participant's experiment was done separately to avoid bias from pre-test or during the test encouragement and to ensure that each subject experienced the identical conditions. Additionally, given the small size of the room, experimenting separately was also done to lessen the possibility of copying the answers. Moreover, VE and non-VE group participants had the same confederate to encourage the experiment.

Before starting the experiment, the participants were told that the test was done to assess their problem-solving skills and the encouragement part was omitted until the debriefing after the test. First, the participants had to complete a form with basic demographic data about themselves, which included their age and gender. Following that, rapport was established between the confederate and the subject for five to seven minutes for both experimental groups. Rapport building was carried out to develop trust between the confederate and the participant, as research suggests that encouragement is most effective when given by someone the recipient trusts (Wong, 2015). A brief task briefing that followed allowed participants to clear up any questions they had about the procedure. The control group received their task briefing immediately following the completion of the demographic data form, in contrast to the other two groups. No rapport building was conducted for the control group, but the briefing of the task was the same for all conditions.

For the control group, the confederate was present to invigilate the experiment, but no encouragement was provided. In contrast, for the VE condition, the same confederate made scripted encouraging statements during the rapport-building phase, as well as during the test. This comprised of two encouraging statements during the first five minutes and another two during the final five minutes. Likewise, the same confederate was present in the room for the non-VE group and exhibited emotional encouragement through her facial expressions (smiling and nodding). The confederate smiled and nodded twice during the first five minutes, and again twice during the last five minutes. Therefore, the conditions were almost identical for all groups except for the encouragement and rapport building as described above. After completing the experiment, the participants were debriefed and were told that the lucky winner among the participants would be informed later.

When experimenting, the participants were not given the answer sheets because it was found during the preliminary study that when participants noted the answers, they tended not to look at the confederate, which was not ideal for the non-VE condition. This is because it is required for non-VE participants to glance at the confederate during the experiment to see the facial expressions. However, since it would reveal the purpose of the experiment, the participants were not informed of this requirement; hence, the method of answering was changed for the actual experiment based on this experience. Therefore, all participants from all three conditions were asked to point towards the answer they chose for each question, and the confederate recorded the responses on an answer sheet. As anticipated, it was found that when they pointed out the answers, the participants had a natural tendency to glance at the confederate, which created the opportunity for the confederate during

the non-VE condition to make the necessary non-verbal cues as planned.

Ethical Considerations. Ethical concerns were given careful consideration by obtaining informed consent and maintaining anonymity, even though a single-blinded method was practised. This method was necessary for the study design to generate the desired level of accuracy of the results. Therefore, even though there was deception during the time of the experiment, all participants were thoroughly debriefed after the experiment, and they were requested not to disclose this information to any other participant until the data collection was completed. It should be noted that this request was made verbally during the debriefing and was not included in the consent form because it was given before the experiment. As a result, it is possible that it was not as effective as it could have been. However, no records of leaking the purpose of the study by any participant were noticed during the data collection period.

The research was approved by the Research Ethics Committee at Maldives National University before it was conducted. The consent of each participant was obtained via a consent form before beginning the experiment, which indicated that withdrawal from the activity was possible at any time.

Data Analysis. Performance was measured based on the number of correct answers given during the time frame of 10 minutes (a correct answer=1 point). All the correct answers were added to generate the final score for the participant's performance during the task. All data were analysed using SPSS software.

RESULTS

Table 1 presents the age differences among the respondents who took part in this study. Total number of participants were 33 (M=27.94), of which 12.1% were between 18-25 years of age, 36.4% were 23-27 years, 30.3% were 28-32 years, and 21.2% were 33-37 while no participant was 38 or older.

Table 1: Age

Age Group	Frequency	Percentage
18-25	4	12.1
23-27	12	36.4
28-32	10	30.3
33-37	7	21.2

The 11 participants in the control group (no-encouragement condition) had an average performance score of 27.45 (SD=4.228) as show in Table 2. The 11 participants in the non-VE condition had an average performance score of 38.09 (SD=4.969), The difference in mean score between the no-encouragement condition and the non-VE condition was 10.64 (no-encouragement=27.45, non-VE=38.09). For the 11 participants who were assigned to the VE condition, the performance score was 42.45 (SD=4.655) The difference of score between non-VE condition and the VE condition was 4.36 (non-VE=38.09, VE= 42.45). With a range of 15, the no-encouragement condition and the VE condition had the highest difference in average performance score (no-encouragement=27.45-VE=42.45).

Table 2: Descriptive Analysis

	Condition		Statistic
Performance score	No Encouragement	Mean	27.45
		std. dev.	4.228
	Non-Verbal Encouragement	Mean	38.09
		std. dev.	4.969
	Verbal Encouragement	Mean	42.45
		std. dev.	4.655

Table 3: Independent T-Test according to gender

	Gender	N	Mean	t	df	Sig.
Performance score	Male	17	37.06	0.798	31	0.431
	Female	16	34.88			

Table 3 shows the result of an independent-samples t-test that was done for performance scores according to gender. Results indicated that the mean score of performance for 17 males was 37.06 while the mean score for 16 females was 34.88. This difference was statistically non-significant at the 0.05 level (t(31) = 0.798, p = 0.431). Although not statistically significant, the small mean difference of 2.18 points suggests there was little practical difference in performance scores between male and female participants.

Manipulation Checks

Table 4: ANOVA Test Analysis

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1309.636	2	654.818	30.582	0.000
Between Groups	642.364	30	21.412		
Total	1952.000	32			

Performance Score

Table 5: Multiple Comparisons

(i) Condition	(j) Condition	Mean Difference (I-J)	Std.Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
No Encouragement	Non-Verbal Encouragement	-10.636*	1.973	0.000	-15.64	-5.63
	Verbal Encouragement	-15.000*	1.973	0.000	-20.00	-10.00
Non-Verbal Encouragement	No Encouragement	10.636*	1.973	0.000	5.63	15.64
	Verbal Encouragement	-4.364	1.973	0.104	-9.37	0.64
Verbal Encouragement	No Encouragement	15.000	1.973	0.000	10.00	20.00
	Non-Verbal Encouragement	4.364	1.973	0.104	-0.64	9.37

The assumption check confirmed that the obtained data satisfied all requirements for a one-way ANOVA,

thus, this test was conducted to compare the effects of encouragement on performance scores. Results indicated that there was a significant effect of encouragement on the performance score of the reasoning task ($F(2,30)=.30.58$, $p=.000$). Therefore, the hypothesis of this study was accepted.

Post hoc analysis with a Bonferroni adjustment revealed that the task performance score significantly increased when participants received verbal encouragement as opposed to no encouragement (15.00 (95% CI, 10.00 to 20.00), $p < .000$) with the same effect on non-verbal encouragement as opposed to no encouragement (10.636 (95% CI, 5.63 to 15.64), $p < .000$). However, there was no statistically significant difference in performance between verbal and non-verbal encouragement (4.364 (95% CI, -9.37 to 0.64), $p < .104$). Even though there was no statistically significant difference among VE and non-VE conditions in performance scores, results suggest that both experimental conditions had a significant effect on performance scores when compared with no encouragement.

DISCUSSION

The current study measured the effects of encouragement on performance scores of an abstract reasoning task. Encouragement was measured in three levels: verbal and non-verbal encouragement, along with a control group that did not receive any encouragement. One-tailed hypothesis testing was used to investigate whether VE significantly improved performance in solving abstract reasoning tasks when compared to providing non-verbal encouragement and no encouragement. The results indicated that both VE and non-VE improved performance when compared with no encouragement. Additionally, no significant gender differences among the 17 males and 16 females who participated in the study were found in the performance scores.

The current study's results supported the research done by Guéguen (2004) on non-VE of student involvement, where the researchers used forearm touching as a form of non-VE and found it to have a significant effect on the desired behaviour of the students. In the current study, non-VE in the forms of nodding and smiling resulted in a similar increase in performance when compared with no encouragement. However, when interpreting these findings, it is important to consider the cultural context. In Maldivian culture, gestures like nodding and smiling are commonly understood as signs of agreement or approval, which may have amplified the perceived encouragement by participants, potentially influencing the results. Likewise, results of the current study on performance scores with VE suggested a significant increase when compared with no encouragement as well. This result supports the findings of Luzzo & Taylor (1993), as well as Brownlow et al. (2011), where they found a significant increase in performance with VE when compared with no encouragement. On the other hand, the current result partly supports Roberts et al. (2015)'s study where they tested encouragement on all three levels that were tested in the current study and found performance increased with only VE and not the other two levels of encouragement. The current study, however, found a performance increase with both forms of encouragement as opposed to no encouragement. Similarly, while Furlich (2016)'s study findings demonstrated a significant improvement in performance with VE when compared to non-VE, the results of the current study did not support this finding, as it suggests that while encouragement in any form improves performance, it is unaffected by whether it was given verbally or non-verbally. Another study by Bambaeroo & Shokpour (2017) found that both verbal and non-verbal communication improved teacher-student relationships. Non-verbal communication, which includes non-VE, was more reliable than verbal communication. According to the researchers, this is because people tend to pay more attention towards non-verbal cues which tend to reveal the intention of the sender and reflect his/her emotional reactions. However, as mentioned, the current study did not find any significant effect between the performance scores of VE and non-VE groups.

The results of the current study also provide further support for theories of positive psychology and encouragement, especially in the area of counselling and psychotherapy. As such, Adlerian therapy suggests that human behaviour is goal-oriented, socially embedded and that clients' behaviour can best be conceptualised in terms of how they try to achieve those goals within the concept of their relationship with others (Carlson et al., 2006). In this regard, this therapy views clients as discouraged rather than having an illness, and encouragement is considered the main antidote used in the foundational process to overcome the clients' discouragement (Carlson et al., 2006). Therefore, encouragement used in this form of therapy fosters intrinsic motivation to change, which helps to achieve the therapeutic goals. Similarly, in solution-based therapy (SFT), instead of discussing the origins of the client's concern, counsellors focus on identifying solutions and on the client's positive and negative resources (Wong, 2015). Therefore, techniques such as miracle questions and complementing used in SFT (Wong, 2015) can reflect encouragement because they help clients identify solutions for their problems and instil hope or confidence, which facilitates positive change. Hence, as suggested in the results of the current study, when providing such therapies, counsellors can focus

on verbal and non-verbal encouragement techniques to improve effectiveness and achieve therapeutic goals.

Moreover, a large quantitative review of counselling psychology found that therapeutic alliance and hope were among four of the most frequently mentioned factors that lead to effective counselling outcomes which are directly mediated by encouragement (Owen et al., 2010). As such, verbal encouragement was found to strengthen the therapeutic bond between clients and therapists through effective and affirmative statements like "This is what I really admire about you" as it increases the therapist's chance of being liked by the client. Similarly, research by (Bedi et al., 2005), found that therapist's use of both verbal and non-verbal encouragement in forms of affirmative comments and expressions improves client perceptions towards therapists and instils hope which would in-turn produce positive therapy outcomes. Encouragement can be used as a tool to strengthen the client's willingness to complete tasks (Castonguay & Beutler, 2006). Furthermore, VE can also be a reaffirmation tool in uplifting one another in group therapy, as it can promote empathy, understanding, and self-confidence (Wong, 2015). On the other hand, only therapists who possess a certain set of traits can offer encouragement that is effective. Based on research, Wampold (2014) suggests that in order for verbal encouragement to be effective, therapists should be able to effectively communicate hope and optimism, along with being influential and persuasive. Therefore, it is suggested to train counsellors to cultivate the necessary social and cognitive skills and to actively practise those skills, to make sure that the encouragement provided during sessions is effective.

When considering the application of results of the current study in an organisational setting, it should be noted that the results suggest that there is a significant positive impact on performance regardless of the type of encouragement that the individual receives, managers and supervisors of organisations may find it particularly useful to employ encouragement-based tactics to motivate staff for optimal performance. Verbal encouragement can be provided in the form of phrases like 'you have the capacity to do this', 'we are counting on you' when working on projects. Non-verbal encouragement can also be provided in many forms including simple nodding, smiling or clapping in appropriate context. Additionally, since both verbal and non-verbal encouragement (VE and non-VE) are forms of communication, different communication tools can be used to convey encouragement when initiating projects, while working on projects, and when struggling to reach project or organisational goals. This can increase employee confidence and motivation (Beets et al., 2010), which will improve overall performance. Moreover, encouragement coming from superiors can be perceived as an act of empathy and humanity, which can also lead to employee loyalty. Furthermore, Mutuku (2014) found that motivational verbal and non-verbal communication, which can be considered as forms of encouragement tend to increase employee morale, promote empowerment and trust, increase team cohesion, increase effective decision making, facilitate learning and remove ambiguity and uncertainty. This also supports the current study, suggesting the positive effects of encouragement, especially applicable in an organisational setting.

The findings of the current study can also be used in a variety of other disciplines, such as sports to improve individual and team performances, and in education to encourage students to perform better and teachers to facilitate classes more effectively. Governments and school administrations can raise awareness and train teachers and parents to be able to effectively support students. Students can also be taught to support one another in school and outside of it, which can help them develop people skills and grow more compassionate and sympathetic as individuals. In the same way, encouragement can be given special attention in the field of medicine to aid patients to improve their strength, optimism, and recovery. Additionally, encouragement can also be useful in family dynamics, inspiring one another to grow, be empathetic towards each other, provide support to achieve one another's goals, and generally to establish healthy relationships. Furthermore, instilling encouragement in all these facets of society can also promote prosperity and community cohesion, which in turn can help minimise issues such as prejudice, stigma, bullying and harassment.

RECOMMENDATIONS

As previously highlighted, encouragement is a psychological topic that is understudied and given less weight in textbooks. However, the findings of this study may stimulate interest in this area among other researchers, which would enable them to create accurate instruments for measuring encouragement and advocating its application. This is particularly important because, throughout the process of reviewing the literature for the current study, no standard measure specifically designed to quantify encouragement was identified. Future tools could consider incorporating multiple dimensions of encouragement, such as tone (e.g., whether the encouragement is delivered warmly, sternly, or neutrally), frequency (how often encouragement is given during a task), and source credibility (how trustworthy, competent, or relatable the encourager is perceived to be by the recipient). These elements could

influence both how encouragement is interpreted and its effectiveness in enhancing motivation and performance. Including such constructs could help researchers develop a more nuanced and culturally adaptable measurement scale for encouragement. In the Maldivian context, for instance, where hierarchical relationships and respectful tone play a strong role in communication, especially in educational or workplace settings, acknowledging cultural variations in how encouragement is perceived could lead to more accurate and applicable assessment tools. Similarly, additional research may create stronger manipulations with a larger participant base, that could yield more accurate results on the topic of performance. On the other hand, as there is conflicting evidence in the literature about the impacts of encouragement on gender, future research can also be directed toward this area while simultaneously looking into other moderating factors. Also, since the effects on performance with VE and non-VE were looked at separately in this study, it would be interesting to compare the results of the VE and non-VE groups with those of the combined group (a mix of VE and non-VE). This would show if giving both types of encouragement at the same time has a bigger effect on performance than giving them separately. Furthermore, according to Sweeny (2009), encouragement is often seen to be provided in challenging situations to instil courage and motivation. However, it can also be intriguing to observe whether encouragement can result in performance differences on challenge-focused activities compared with simple tasks. Finally, to ensure that verbal and non-verbal encouragement was effectively delivered, it would have been more thorough in the current study if perceived encouragement was examined within groups. This would have allowed us to confirm whether the groups felt and perceived the intended encouragement that was deceptively provided during the experiment.

LIMITATIONS

Given that the study involves challenging reasoning tasks, one limitation of the current study could be that it did not account for individual differences such as cognitive level and educational achievement. While it was assumed that people working in a public organisation would have a certain level of education, it does not mean that everyone has the same level of cognitive functioning. Therefore, the abstract reasoning task administered in the current experiment could have been too easy or too difficult for some people. Additionally, choosing people from the same department, which consists of only 53 people, makes it unlikely for the participants to have the same level of education as an organisational department will usually have different levels of staff based on educational achievement. Hence, it could also affect performance score. Furthermore, choosing participants from a specific department may have been the cause of having a sample size of similar age (M=27). This might have affected the results, as studies (Sedek et al, 2021; Emery et al, 2008) found that reasoning abilities differ across age groups, especially for older people who show a decrease in performance of reasoning tasks when compared with younger people. Hence, this difference could have been investigated, and effects of it could have been avoided if participants had been drawn from a wider range. Likewise, the study's limited sample size and controlled environment should also be considered major limitations of the study. For example, there was no inspection or regulation of the meeting room temperature or the controlled environment with just one person present with the participant alone in a meeting room, all of which could have affected the participant's mood and functioning, which could have affected the results.

Another important procedural limitation involves the decision to have participants point to their answers rather than write them down. This change, made after a preliminary test, ensured that participants in the non-VE condition would naturally glance at the confederate, allowing for the delivery of non-verbal encouragement. However, this modification may have reduced the ecological validity of the study, as it does not reflect how reasoning tasks are typically completed in real-world workplace settings. Moreover, this approach may have inadvertently increased participant self-awareness or influenced performance due to the presence of the confederate during response recording. Such procedural adjustments, while necessary for maintaining experimental control, limit the generalisability of the findings to typical workplace problem-solving scenarios.

One might also criticise that the procedure was very time-consuming and complicated, as it would require great concentration to complete the reasoning task, and providing VE could have caused distractions that may have affected concentration. However, due to the nature of the topic and the availability of resources, a simpler procedure or an easy task might not have produced the desired precision of the results. On the other hand, one of the most notable findings of the current study is that there was no significant difference in performance scores between the VE and non-VE groups. While this significance could not have been noticed due to the small sample size, it could also be because of the way VE and non-VE were conveyed, especially given the cultural context, which was not accounted for in the current study. For instance, nodding is a prominent form of agreement in the Maldivian linguistic culture, meaning that if the participant saw the confederate nodding when pointing

to the answers, it gave a probable indication of being right. Likewise, the phrases that were used in the VE condition may have sounded sarcastic or not genuine to some participants, especially since the task only lasted 10 minutes. This suggests the need for future studies to conduct preliminary pilot testing of verbal encouragement phrases to ensure cultural appropriateness and perceived sincerity, thereby increasing the internal validity of the manipulation. This could mean that the effect of VE might not have been as strong as it was intended to be. Additionally, future studies could include participant feedback or perception checks (e.g., short post-task surveys) to evaluate how encouragement was received and interpreted, providing a manipulation check that validates the effectiveness of the intervention. Hence, these misinterpretations could have affected the results, which could have led to not producing any significance in scores among VE and non-VE groups. In summary, limitations such as the small sample size, not considering the individual differences and cultural context could all contribute to the low ecological validity of the study.

CONCLUSION

The findings revealed that VE and non-VE significantly improved performance in solving the abstract reasoning task when compared to providing no encouragement. No significant difference in performance scores was found between VE and non-VE conditions, which could have been due to limitations like misinterpretation or other environmental factors like the experimental setting. Despite such limitations, there are numerous social implications for this study. The findings can be applied to fields like education to assist teachers in helping students improve their performance and increase their motivation to study. It can be used in counselling and psychotherapy to help patients cultivate optimistic outlooks and foster support for those seeking therapy. Furthermore, because verbal and non-verbal encouragement can be delivered without cost and with minimal training, such interventions may be particularly scalable and impactful in low-resource settings such as small schools, local clinics, or community organisations. Similarly, it can also be used in the medical sector to motivate patients to work towards their recovery as well. Moreover, parents and couples can be taught how to develop healthy relationships and family resiliency, along with organising training for groups to promote positive encouragement and building interpersonal support in the community. Therefore, as the study's findings demonstrate, encouragement can have a positive effect on performance, just as it does on a variety of other aspects of life.

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INSTITUTIONAL REVIEW BOARD STATEMENT

This study was conducted in accordance with the ethical guidelines by the Maldives National University' Psychology Department's Ethics Committee for research involving human participants. Ethical approval was granted by the relevant authorities in September 2022.

DATA AVAILABILITY STATEMENT

The data presented in this study are available on request from the corresponding author due to privacy and institutional restrictions.

DISCLOSURE STATEMENT

The authors declare no conflict of interest.

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