Win-win-win papakonstantinidis social dilemma

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Abstract

Research **on the equilibrium** between what is best for individuals and what is best for collectives has long been central to sociology and other social sciences (Simpson and Willer, 2015). In explaining the sources of cooperation and prosocial behavior, psychologists, behavioral economists, and biologists often focus on factors internal to the individual, such as altruistic motives, preferences, and prosocial emotions. In contrast, sociologists emphasize social forces external to the individual, including norms, reputation systems, and social networks. Evidence for these norms, reputations, and relationships is reviewed, showing that they have strong and pervasive effects on cooperation and prosocial behavior. The scientific discussion highlights two emerging themes of the reviewed literature. First, although these categories of sociological mechanisms typically promote cooperation, their presence may also create ambiguity in individuals about the reasons for their own and others' prosocial actions, and this ambiguity may undermine future sociability in subsequent contexts where mechanisms are absent . Second, altruistic preferences and social mechanisms often interact, so that the causal importance of altruism is reduced where these mechanisms are present.

As a social value orientation, win-win mainly reflects a situation where one actively considers and cares for others to pursue self-interest. Win-win is the realization of maximizing the interests of both sides, which is a harmonious development with mutual benefits. On the one hand, competition is not a zero-sum game, and the interests of different parties are so intertwined that the growth of one party often benefits others. damage to one party's interests will often spread to other parties at the same time. By improving the collaborative relationship between interrelated stakeholders, existing resources can be used more effectively or new resources can be developed to achieve the effect that one plus one is greater than two. In other words, all parties work together to "make the cake bigger" so they can get more benefits.

In a psychological order "win-win-win" indicates legitimate and certain principles of governance Introduces "superego" in place of "individualism".

From a psychological perspective, negotiation refers to any form of interaction in which people with different and conflicting interests communicate and discuss what steps they could take together to resolve their difference of opinion.

The good negotiator has TWO in front of him and not one. This differentiation psychologically moves the negotiation to a level of empathy and community and effectively reduces the possibility of disagreement, or the collapse of the

> agreement, as evidenced by the two studies below
>
> From the unbridled A win-lose competition (John von Neumann) to win-win cooperation (JF Nash) and from there to humanism win-win-win (Papakonstantinidis)
>
> The psychological function on the personal level as an individual but on the collective as a citizen The "conflict" between the individual and the collective is expressed in "I win-you win-we win" (win-win-win) She the idea contributes to the functioning of negotiation in psychoanalytic therapy to reduce the effects of transference and countertransference
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> The win-win-win involves three elements in one: individualism-empathy-communitarianism.

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Summary

Research **on the balance** between what is best for individuals and what is best for collectives has long been central to sociology and other social sciences (Simpson and Willer, 2015)[1]. In explaining the sources of cooperation and prosocial behavior, psychologists, behavioral economists, and biologists often focus on factors internal to the individual, such as altruistic motives, preferences, and prosocial emotions. In contrast, sociologists emphasize social forces external to the individual, including norms, reputation systems, and social networks. Evidence for these norms, reputations, and relationships is reviewed, showing that they have strong and pervasive effects on cooperation and prosocial behavior. The scientific discussion highlights two emerging themes of the reviewed literature. First, although these categories of sociological mechanisms typically promote cooperation, their presence may also create ambiguity in individuals about the reasons for their own and others' prosocial actions, and this ambiguity may undermine future sociability in subsequent contexts where mechanisms are absent. Second, altruistic preferences and social mechanisms often interact, so that the causal importance of altruism is reduced where these mechanisms are present.

Accumulating evidence has shown that win-win is necessary for both individuals and society.

As a social value orientation, win - win is primarily reflected in a situation where one actively considers and cares for others to pursue personal interests. Win - win is the realization of the maximization of the interests of both sides, which is a harmonious development with mutual benefits. On the one hand, competition is not a zero-sum game, and the interests of different parties are so intertwined that the growth of one party often benefits others. damage to one party's interests will often spread to other parties at the same time. By improving the collaborative relationship between interrelated stakeholders, existing resources can be used more effectively or new resources can be developed to achieve the effect that one plus one is greater than two. In other words, **all parties work together to "make the cake bigger "**so they can get more benefits.

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A good negotiator has TWO in front of him, not one. This differentiation psychologically moves the negotiation to a level of empathy and community and effectively reduces the likelihood of disagreement or deal collapse, as demonstrated by the two studies below.

From the extreme competition A win - win (John von Neumann) to win - win cooperation (J.F. Nash) and from there to win - win - win humanitarianism (Papaconstantinidis).

The psychological function on the personal level as an individual but on the collective as a citizen The "conflict" between the individual and the collective is expressed in "win-win-win" (win-win-win) This idea contributes to the function of negotiation in psychoanalysis therapy to reduce the effects of transference and countertransference.

Win - win - win includes three elements in one: individualism-empathy-community.

1. Introduction

Think interdependent, not independent.

If we start from the proposition that there will be differences and disagreements in all relationships, then it follows that how you resolve those disagreements will be critical to the continued success of those relationships. You see, every disagreement will have a solution. You want to make sure the resolution doesn't leave either of you with lingering hurt or resentment.

In resolving disputes and disputes, there are only four possible outcomes.

1. One is for the resolution to be good for you but not for the other person. We call this a win-lose. The danger in this is that the other person may feel defeated, scorned or resentful. These lingering feelings may well contaminate the relationship, ultimately leading to unhappiness for you.
2. A second is that the resolution benefits the other person but not you — a win - lose proposition In this, you may well feel upset, possibly contaminating your future interactions with that person, making harmony and happiness a casualty.
3. A third solution is that it ends badly for both of you. You both feel like you missed out, and you'll probably both carry bad feelings. There is unlikely to be happiness here for anyone, and the future of the relationship may well be in jeopardy.
4. The best outcome is when you work hard to find a solution that works for both of you. You make sure there are no losers. You both win and feel good about the outcome. This ensures that you both continue to enjoy the relationship without being dragged down by hurt or resentment.

Win–Win practice

The win-win process is quite simple and straightforward, however it is often not easy to achieve. That's because it requires a very different mindset than most of us bring to our arguments. In addition, it takes a little patience and self-control, as you will see below. But, if you take the trouble to follow the process, you will be pleasantly surprised by the solutions you find and enjoy the increased happiness.[2]

Written by Leon F. _ Seltzer[3]... “When couples engage in increasingly combative conversations, neither feels heard, understood, empathized or validated.

For most people, if their point of view is valid, their partner's different point of view must be wrong.

In the "70/70 compromise," each party's ability to successfully serve the other allows both to get most of what they want.

As long as couples truly agree to disagree, enduring differences will not make their relationship untenable.

In all relationships, when two parties disagree, it is important to find compromises that are truly acceptable to both parties: compromises where neither party ends up feeling that they had to lose their personal integrity.

Achieving such a solution is especially important in committed relationships where repeated unresolved disagreements usually result in mutual estrangement. And this generally heralds the end of any warm, trusting relationship between them.

That lose - lose and win - lose ultimately lead to the same result.

How could they when they're both busy talking, and neither is really listening, but instead obsessing over how best to come up with their next rebuttal? The pair remain embroiled in fruitless and increasingly combative iterations – with neither feeling heard, understood, empathised or validated.

The problem is that both—with the deepest sense of justice—firmly believe that their perspective is the only one that can be valid. Because for most people, if their view is right, their partner's different view must be (by their own biased definition) wrong.

But such a conclusion belies the fact that anyone's perspective warrants being considered valid—and just as valid as anyone else's. Why; Because all opinions are subjective and accurately reflect one's beliefs (at the time). And this is true regardless of how logical or "rational" a person's perspective may be.

And this is the essence of almost all conflicts between couples, as well as the suggestion of what should happen if their conflicts are finally pursued. In short, the war effort to prove each other wrong in order to feel themselves right is—and, unfortunately, always will be—a losing proposition.

Moreover, win-lose is itself a variant of lose - lose Here neither party seems to realize that even if they succeed in stifling their partner's perspective and making him give it up, the resulting damage to the relationship it will far exceed any immediate victory.

In these cases, the loser will likely try to win even by sabotaging the other's apparent triumph (as in, “I'll admit it now because this argument is exhausting me, but—just wait!—I'll find a way to beat you come back"). Thus, the individual's victory, at the unacceptable cost of the other, will entail a cost to the relationship far greater than the supposed success of the winner.

And even if, behind the scenes, the alleged "loser" does not plot revenge but passively submits to his partner's more

dominant will, the result is likely to be either a depressed withdrawal from the "winner" or a growing need to create distance from the —physically, mentally and emotionally. And this represents a significant loss of relationship for both partners.

A willingness to compromise sets the stage for a win-win

The ever-popular concept (or, by now, cliché) of win-win is somewhat paradoxical. Because it cannot help but include remedies where no one person gets everything they want. As ideal as such a feat is, it is too idealized. It's just not realistic - in fact, it's not even possible"

Accumulating evidence has shown that win - win is necessary for both individuals and society. This research, comprising two studies, aimed to develop and validate a measure of the win - win scale . In the first study, we examined the items by item analysis and extracted common factors using exploratory factor analysis (EFA), thus identifying a total of 25 items in the original scale consisting of five dimensions, such as integrity, progress, altruism, harmony, and coordination. . In the second study, we used first- and second-order confirmatory factor analysis (CFA) to test the construct validity of the scale. The results showed a good fit between the five-factor model and the data. Based on our results, we have formed a win - win scale keeping 16 items from the original project team[4].

However, if both partners can be open-minded enough to accept each other's carefully considered concessions, they can overcome their aggravating confrontation. Only then can they end whatever emotional turmoil their conflict has caused them[5].

In the past, they have written about what has been called "the 70/70 compromise", which means that successfully adapting to each other allows both partners to get most of what they want. As a result, no one leaves the table smugly believing that they have triumphed over their partner or, disappointed, that they have been vanquished or defeated by them.

Contrast this with win-lose outcomes, where one side, if only to keep the stressful battle from escalating further, submits to the other. Here the apparent "loser" will inevitably experience negative feelings about what they have unfortunately accepted. Thus, although heated confrontation has been avoided, no real closure has occurred.

And if lose - lose? This means that both parties righteously cling to their point of view as if their very lives depended on it. Because they have become so identified with their point of view that they cannot help but experience their relationship as secondary to it. In fact, one party may be okay with working toward a compromise, but if their partner isn't, the dialogue will go nowhere.

Unfortunately, lose - lose can be the death blow for a relationship. If couples cannot work together to find a path to at least partial agreement, they are implicitly sending each other the message that their incompatibility is irreparable.

It is not surprising that no couple can be compatible in all areas. There are simply too many things to be different about. However, even if some differences between them may never be settled, this does not mean that their relationship is unfounded. As long as both parties can truly accept these enduring hardline differences, mutual resentment can be

avoided. And my previous article on what “agreeing to disagree” really means explores this topic in more detail.

By returning to the innermost core of winning solutions, what couples can learn to accept about each other, they can live comfortably. So once they learn the fine art of compromise, their differences no longer need to interfere with their relationship satisfaction

Research on the balance between what is best for individuals and what is best for collectives has long been central to sociology and other social sciences (Simpson and Willer, 2015) [6]. In explaining the sources of cooperation and prosocial behavior, psychologists, behavioral economists, and biologists often focus on factors internal to the individual, such as altruistic motives, preferences, and prosocial emotions. In contrast, sociologists emphasize social forces external to the individual, including norms, reputation systems, and social networks. Evidence for these norms, reputations, and relationships is reviewed, showing that they have strong and pervasive effects on cooperation and prosocial behavior. The scientific discussion highlights two emerging themes of the reviewed literature. First, although these categories of sociological mechanisms typically promote cooperation, their presence may also create ambiguity in individuals about the reasons for their own and others' prosocial actions, and this ambiguity may undermine future sociability in subsequent contexts where mechanisms are absent. Second, altruistic preferences and social mechanisms often interact, so that the causal importance of altruism is reduced where these mechanisms are present.

As a social value orientation, win - win is primarily reflected in a situation where one actively considers and cares for others to pursue personal interests. Win - win is the realization of the maximization of the interests of both sides, which is a harmonious development with mutual benefits. On the one hand, competition is not a zero-sum game, and the interests of different parties are so intertwined that the growth of one party often benefits others. damage to one party's interests will often spread to other parties at the same time. By improving the collaborative relationship between interrelated stakeholders, existing resources can be used more effectively or new resources can be developed to achieve the effect that one plus one is greater than two. In other words, **all parties work together to "make the cake bigger "**so they can get more benefits.

We are a community of common interests and we need to ensure that the knock-on effects on each other are positive, not negative. Therefore, win - win means that common interests can be maximized first and individual interests can be realized best. On the other hand, win - win is based on cooperation which is a key factor in maintaining and stabilizing human society (Falk *et al*., 2001)[7]. Although self-interest is a human instinct, human beings tend to pursue morality, justice which can serve as an adaptive strategy to promote social harmony (Forgas *et al*., 2007)[8]. Being too selfish and too altruistic is not the best way to cooperate (Fehr and Fischbacher, 2003). Success will not be sustainable due to the lack of cooperation of the partner, and so the so-called winners do things that are harmful to others without benefiting themselves. Therefore, individuals must also consider others to achieve win - win when pursuing personal interests, which contributes to the better survival and development of individuals.

2. The Rational Choice

Rational choice theory enjoys unprecedented popularity and influence in the behavioral and social sciences, but poses intractable problems when applied to socially interactive decisions. In individual decisions, instrumental rationality is defined in terms of expected utility maximization. This becomes problematic in interactive decisions, when individuals have only partial control over outcomes, because expected utility maximization is undetermined in the absence of assumptions about how other participants will behave. Therefore, game theory incorporates not only rationality, but also common knowledge assumptions, enabling players to predict their teammates' strategies. Under these assumptions, disparate anomalies emerge. Instrumental rationality, conventionally interpreted, fails to explain intuitively obvious features of human interaction, produces predictions in stark contrast to experimental findings, and breaks down completely in some cases. In particular, focal point selection in pure coordination games is inexplicable, although easily achieved in practice. The intuitively compelling principle of reward dominance lacks logical justification. Rationality in social dilemmas is self-defeating. a basic solution idea for coalition cooperative games is often unworkable. and rational choice in some sequential games creates contradictions . In experiments, human players behave more cooperatively and receive higher payoffs than strict logic would allow. Orthodox notions of rationality are obviously internally inadequate and inadequate to explain human interaction. Psychological game theory, based on non-standard assumptions, is needed to solve these problems, and some proposals in this direction have already been made.

Win - win is a typical Chinese cultural value recognized by scholars worldwide (Hofstede, 1980)[9], which helps to promote good interaction between people. Interpersonal harmony is an important aspect and practice in Chinese traditional culture (Zhang, 1996)[10]. For example, Confucianism advocated "kindness, justice, decency, wisdom, faith, forgiveness, loyalty, filial piety brotherhood." Each content contains the guidelines for getting along with others, emphasizing collectivity. The meaning of win - win cooperation is also reflected in "if two people come to an agreement, they can overcome all difficulties" in The Book of Changes (Tze, 2011)[11,12] and "one is likely to fail, and if there are many people, it is difficult to defeat" in History as a Mirror (Sima 1956)[13]. Rooted in Chinese traditional culture, win - win is a value orientation of globalization and a common pursuit of human beings. It has a significant impact on Eastern civilization and also plays an essential role in human development in other cultural environments. Advocating for winning values can overcome short-sightedness in the world. In fact, such profitable values are not only needed for China but also for other countries or regions[14]. In addition, a large number of studies have shown that modern society may need to respond to profits from the perspective of reasoning (Yang, 1996)[15]; Therefore, individuals should learn the " win - win " attitude when faced with limited resources and interests, rather than the attitude of "success alone, even without using ethical methods" (Jiao and Su, 2019)[16].

Currently, most studies related to win - win in psychology have focused on trust, cooperation and prosocial behavior (Duijf, 2018)[17]. For example, researchers proposed the reflective model of prosociality to explain why people acted prosocially, stating that people were born as creatures with amoral and purely selfish tendencies, whereas prosocial behavior required the exercise of reflective control in this selfish instinct (Metcalfe and Mischel, 1999)[18] Furthermore, the human drive for cooperation and altruism has been one of the most powerful forces shaping our society (Alos - Ferrer and Garagnani, 2018)[19]. With the continued acceleration of globalization in today's world, large-scale human cooperation was needed (Buchan *et al*., 2009)[20]. On average, people became more cooperative with age, perhaps because experience taught

them that cheating in many settings was a losing strategy in the long run (Matsumoto *et al*., 2016)[21], so honesty and cooperation was a desirable strategy [22].

Meanwhile, prosocial behavior was defined as a broad category of actions that were generally beneficial to other people, such as cooperating, sharing resources, and helping others (Penner *et al*., 2005) [23]. Furthermore, trust was critical to building and maintaining relationships and active cooperation The ability of society to induce its members to cooperate spontaneously characterized the extent of social cohesion within that society In social dilemma cooperation always had a more outstanding outcome for all individuals. In a two-person social dilemma (e.g., a prisoner's dilemma), mutual cooperation always had a greater outcome for each individual than mutual defection. However, win - win requires consideration of transfer, meaning the achievement of optimal state of coordination between individuals and the collective. In the win - win situation, both sides need mutual care and mutual benefit. Otherwise, neither side will get a good result.

Is rational social interaction possible? This may seem a surprising question, given the Apollonian flavor of the contemporary behavioral and social sciences. Rational choice theory (RCT) is the cornerstone of neoclassical economics (Arrow *et al*., 1996) [24]; In political science, RCT began to mushroom after the publication of Social Choice and Individual Values (Arrow 1963) and transformed the discipline within a few decades (Friedman 1996; Green & Shapiro 1994; Ordeshook 1986). In sociology, Weber's (1922/1968) analyzes of law and economics as models of rationality prepared the ground for the germination of RCT ideas half a century later (Abell 1991; Coleman & Fararo 1992; Hollis 1987; Moser 1990). . Theories of behavioral ecology (Dawkins 1989; Krebs & Davies 1987), and in particular, the evolution of social behavior (Maynard Smith 1984), were revolutionized by the introduction of RCT-based game theory in the early 1970s (Maynard Smith

3. Psychological Structure win - win

Few studies have directly investigated the psychological construct and measurement of win - win . Until now, researchers have developed the scale of general trust, the scale of adolescent prosocial behavior, the scale of self-consistency and relevance, the scale of interpersonal trust and the scale of cooperative and competitive personality (Rotter , 1967) [25], On the one hand, these concepts of trust, prosocial behavior, harmony and cooperation differ from profitable ones. Trust is "the degree to which a person is confident and willing to act on the words, actions, and decisions of another" (McAllister, 1995)[26]. Trust is critical to building and maintaining relationships and to effective collaboration. In cooperative behaviors, individuals provide immediate benefits to others at a cost to themselves, which we will call prosocial (Henrich and Henry, 2006)[27]. In short, trust and cooperation are important ways and means of achieving win - win outcomes , and win - win is a very important prosocial behavior that has been neglected by psychological researchers. On the other hand, based on the detection of the win - win structure (Zhang and Zhang , 2020) , the psychological dimensions of the [28] win - win scale may differ from these scales, such as the General Confidence Scale, the Adolescent Hypersocial Behavior Scale, self-consistency and relevance scale. Furthermore, cooperation is based on prosocial behavior and trust (Kramer, 1999)[29], and high levels of cooperation cannot be sustained simply based on preferences and generalized trust that people have in themselves (Simpson and Willer , 2015)[30]. Only by taking the concept of win - win as a value orientation can all

stakeholders maintain their survival and development in today's pluralistic society. Therefore, the development of a win - win scale has important implications for individuals and society.

Based on the structural dimensions of win-win from Zhang and Zhang (2020), the study below aimed to further develop the win-win scale as a useful assessment tool

4. Rationality in psychology[31]

In psychology, the picture is admittedly more complex. Since the publication of Freud's first metapsychological writings, and in particular his account of the distinction between two principles of mental functioning,

5. Bounded rationality

This paper is not simply concerned with the accuracy of RCT in predicting human behavior. The concept of bounded rationality (Simon 1957)[32] has been widely accepted and confirmed by experimental evidence. Bounded rationality forces us to use rough and ready rules of thumb (heuristics) that can lead to predictable judgment errors and biases, many of which have been empirically investigated (Bell *et al*., 1988; Kahneman et al. 1982);[33] but [34] which allow us to solve problems quickly and efficiently (Gigerenzer & Goldstein 1996)[35] For example, a simple win-stay, lose-change rule can lead to the development of a mutually beneficial cooperation in a group of players who ignore not only the reward structure of the game but also and the fact that they engage with other players in a strategic interaction (Coleman et al. 1990)[36].

6. Evolutionary game theory

Therefore, game-theoretic equilibrium points can be reached by completely non-rational evolutionary processes. The basic concepts of game theory can be mapped to the elements of natural selection theory as follows. Players match individual organisms, strategies with organism genotypes, and payoffs to changes in their Darwinian fitness—the numbers of self-like offspring they pass on to future generations. In biologically interpreted evolutionary game theory, players do not choose their strategies (genotypes) rationally or even intentionally, but different strategy profiles lead to different payoffs, and natural selection mimics intentional selection. Maynard Smith and Price (1973)[37] introduced the concept of evolutionarily stable strategy (ESS) to handle such games. It is a strategy with the property that if most members of a population adopt it, then no mutant strategy can invade the population through natural selection, and hence it is the strategy we should expect to see commonly in nature. An ESS is always a Nash equilibrium and thus a type of solution for game theory. but not every Nash equilibrium is an ESS.

Evolutionary game theory deals with social as well as biological evolution. It has been intensively studied since the 1970s and the theory is well understood (Hofbauer & Sigmund 1998[38]; Samuelson 1997[39]). Even purely analytical studies can

solve problems and provide useful insights. A simple example with psychological relevance is an evolutionary model of Antisocial Personality Disorder, based on a multiplayer game of Chicken, which provided an explanation for the low but consistent prevalence of this disorder in widely diverse societies (Colman & Wilson 1997, see [40] also Coleman 1995b).

Evolutionary games have also been studied empirically (Maynard Smith 1984), and mostly computationally, sometimes playing strategies against each other and passing copies of those strategies to future generations.

according to their accumulated returns (Axelrod 1984). Evolutionary game theory deals with non-rational strategic interaction driven by irrational trial-and-error-like adaptive processes. Populations of insects, plants, and even computer programs can evolve into game-theoretic equilibria, and cooperation can evolve without rational decision-making. This article, however, focuses on whether full rationality can be applied to social interaction.

Nature of rationality

What is rationality? Broadly speaking, it involves thinking and behaving reasonably or logically, and comes in various forms (Manktelow & Over 1993)[41]. Rational beliefs are those that are internally consistent, and rational arguments are those that obey the rules of logic. Rational preferences and decisions require a more detailed explanation.

7. Rational preferences

Suppose that a universe of alternatives includes a subset A of alternatives that are available in a particular decision context. Decision theorists generally assume that an agent's rational preferences obey the following conditions.

1. **Completeness:** For every pair of alternatives ai and a■. in the Ah , o agent either prefers the a . in a ., or prefers a . s e a., or is indifferent between a and a i.

2. **Transitivity:** Given the alternatives a, a. and ak in A, an agent who considers ai to be at least as preferable to a., and a. at least as preferable to ak, considers ai at least as preferable to ak.

Context-free ordering: If an agent considers ai to be at least as preferable as in A, then that agent considers ai to be at least as preferable to a■. in one augmented set A' containing all elements of A plus additional elements from the universe of alternatives.

These three conditions are collectively called the weak ordering principle (McClennen 1983)[42]. We had to start with a subset of A to make sense of the third condition, which would otherwise be implied by the first.4 Given preferences that satisfy this tripartite principle, a rational decision maker always chooses a maximally preferable alternative (which can not be unique, hence "a" rather than "the"). Experimental evidence suggests that human decision makers often violate the second and third conditions (Doyle *et al*., 1999)[43], although they tend to modify their intransitive preferences, at least when their violations are pointed out to them[44].

8. Rational decisions

Rational decisions or choices are those in which agents act according to their preferences, given their knowledge and beliefs at the time of action. This is instrumental rationality (or means-ends rationality) and can be traced back to the Scottish Enlightenment writings of David Hume (1739-1740/1978)[45] and Adam Smith (1776/1910)[46]. Hume gave his most frequently cited account in his Treatise of Human Nature (2.III.iii):

> *Reason is, and must only be, the slave of the passions, and can never pretend to any other office than to serve and obey them. ... A passion can never, in any sense, be termed unreasonable, but when it rests on a false assumption, or when it pursues means insufficient to the end of the design. (Hume 1739- 40/1978)*[47]

Hume conceived of reason as a faculty that provides the means to achieve ends not afforded by reason. Russell (1954)[48] summed it up clearly: "' Pearson ' has a perfectly clear and precise meaning. It means choosing the right means for the purpose you want to achieve. It has nothing to do with the choice of ends"

9. Expected utility theory

Typically, decisions that maximize expected utility (EE) are rational decisions. EU theory was first presented in axiomatic form by von Neumann and Morgenstern (1947) [49]in an appendix to the second edition of Theory of Games and Economic Behavior. It is based on the weak ordering principle that is extended to games of chance or lotteries between outcomes. It is assumed that a player can express a preference or indifference not only between any pair of outcomes, but also between an outcome and a gamble involving a pair of outcomes, or between a pair of gambles, and that the weak ordering principle holds for these as well preferences.

This requires a further assumption, called the principle of independence (McClennen 1990, Ch. 3)[50]. If g1, g2, and g3 are any three bets and $0 < p < 1$, then g1 is preferred to g2 if and only if a bet involving g1 with probability p and g3 with probability 1 - p is preferred in a game involving g2 with probability p and g3 with probability 1 - p. From this independence principle, together with the weak ordering principle, it is possible to define a function u(g) that assigns a numerical expected utility to each outcome and gamble, such that

Expected utility maximization

According to the theory of revealed preference, which is popular with economists, an individual who is observed to choose alternative ai and reject aj is said to have revealed a preference for a over a and a higher utility for a than a - and the choice behavior therefore maximizes expected utility tautologically. If luck plays a role and the choice of ai does not lead to a specified outcome ci but to a predictable probability distribution over the set of outcomes, then a decision maker who chooses an alternative that maximizes weighted average expected utility (EE) is acting rationally. But if the decision is interactive and the outcome is determined by two or more decision makers, then the interpretation of instrumental

rationality is unclear because, except in special cases, an individual cannot maximize EE in any obvious way. In interactive decisions, EU maximization is undetermined without further assumptions.

Normative theory

The primary goal of game theory is to determine which strategies rational players should choose to maximize their payoffs. Therefore, the theory is primarily normative rather than positive or descriptive. The founding game theorists stated this explicitly (von Neumann 1928, p. 1; von Neumann & Morgenstern 1944)[51]. Luce and Raiffa (1957) did the same [52] when they introduced game theory to the social sciences:

We believe it is vital for the social scientist to recognize that game theory is not descriptive, but rather (conditionally) normative. It states neither how people behave nor how they should behave in an absolute sense, but how they should behave if they wish to achieve certain ends.

Positive theory

If game theory were purely normative, then it would have limited relevance to the (empirical) behavioral and social sciences, because a normative theory cannot be tested empirically, and evolutionary game theory would be pointless. Arguably, game theory becomes positive theory by adding a bridging assumption of weak rationality, according to which people try to do the best for themselves in any given set of circumstances. To err is human, and departures from perfect rationality are inevitable, due to computational limitations or the bounded rationality of incomplete problem specifications. But none of this is inconsistent with the assumption that people try to act rationally. Adding this assumption gives game theory a secondary goal, to make testable predictions, and this justifies the booming enterprise of experimental play.

The experimental gaming literature (reviewed by Col e man 1995a[53], Kagel & Roth 1995 [54], Chs. 1-4, Pruitt & Kimmel 1977 [55]) testifies to the fruitfulness of empirical research within a broad game theory framework. Some important phenomena such as the conflict between individual and collective rationality cannot even be articulated clearly without the conceptual framework of game theory.

10. WIN - WIN - WIN AND SOCIAL CONTRACT

The win-win-win method is really what we need. It should be the guiding principle of a social contract that reflects the social constellations of the world today. It is in line with Rousseau's ambition. Rousseau stated in the introduction to his "Social Contract" that he inquires whether there can be, in a political order, **some lawful and certain principles of government** , which enable men to act as they are, and the laws, also as they may be, in in an ordering possibility**that justice and utility are in no way separated .** Rousseau's demand that we must combine justice and utility fits both win - win - win and our present need to measure human interests admirably.

Indeed **win - win - win** defines Rousseau's social contract through game theory**Shows the interconnection of justice**

and utility Rousseau 's requirement that **justice and utility be combined fits admirably our present need to measure human interests** . **This makes win - win - win Combine justice and utility** Rousseau, in his Discours sur l'origine de l'inegalité (1755, Discourse on the Origin of Inequality) [56], argued that in the natural state men were lonely but also healthy, happy , good and free. What Rousseau called "emergent societies" were formed when people began to live together as families and neighbors. However, this development gave birth to negative and destructive passions, such as jealousy and pride, which in turn encouraged social inequality and human wickedness. The introduction of private property marked a further step towards inequality, as it made law and government necessary as a means of protecting it. Rousseau lamented the "fatal" concept of property and the "horrible" situations that resulted from being removed from a state in which the land belonged to no one.

Civil society as Rousseau described it was created to serve two purposes: to provide peace for all and to ensure the right to property for those fortunate enough to own property. So it was of some advantage to all, but especially to the rich, since it converted their de facto property into legal property and kept the poor destitute. It was, indeed, a somewhat insidious social contract, since the poor got much less of it than the rich.

But Rousseau also believed in the possibility of a genuine social contract, in which people would receive in return for their independence a better kind of freedom, that is, true political or democratic freedom. As described in Du Contrat social (1762, The Social Contract) [57], such freedom is found in obedience to what Rousseau called volonté générale ("general will")—a collective will aimed at the common good or common interest. .

"Rousseau develops his theory in an almost mathematical way, deriving statements from the original position that man must keep close to nature. The 'natural' state, with its original freedom and equality, is hindered by his 'unnatural' involvement of man in collective activities which result in inequality, which in turn violates liberty. The purpose of this social contract, which is a kind of tacit agreement, is simply to guarantee equality and, consequently, liberty as the highest social values... Some political statements, especially about the organization of powers, come from the "offices" of the equality of citizens and their submission to the general will" (Andranik Tangian 2014) Mathematical Theory of Democracy[58])

Rousseau argues that the political aspects of a society must be divided into two parts. First, there must be a sovereign consisting of the whole population, which includes women (in a way not practiced by almost all countries and thus quite revolutionary to suggest), who represents the general will and is the legislative power within state. The second division is that of the government, being distinct from the sovereign. This separation is necessary because the sovereign cannot deal with specific matters such as the applications of the law. To do so would undermine its generality and thereby undermine its legitimacy. Thus, the government must remain a separate institution from the sovereign body. When government exceeds the limits set by the people, it is the people's job to abolish such government and start anew.

Rousseau claims that the size of the territory to be governed often determines the nature of the government. Since a government is only as strong as the people, and that power is absolute, the larger the territory, the more power the government must be able to exercise over the population. In his view, a monarchical government is able to exercise the most power over the people, since it has to devote less power to itself, while a democracy has the least. In general, the

larger the bureaucracy, the more power is required for government discipline. Normally, this relationship requires the state to be an aristocracy or monarchy. When Rousseau uses the word democracy, he is referring to direct democracy rather than representative democracy. In light of the relationship between population size and governmental structure, Rousseau argues that like his native Geneva, small city-states are the form of nation in which liberty can best flourish. For states of this size, an elected aristocracy is preferable, and in very large states a benevolent monarch. but even monarchical power, to be legitimate, must be subordinated to the sovereign rule of law.

According to Rousseau man sacrifices his individual freedom to obtain his political freedom which is superior because it indicates cohesion in a community On the other hand, "win-win-win" indicates the necessity of connecting utility with empathy and social justice One might say that "political freedom" is synonymous with "we win" because the citizen shows "bravery" by accepting the collective-common benefit behind each negotiation

In a political order "win-win-win" indicates legitimate and certain principles of governance Introduces "superego" in place of "individualism"

The citizen functions on the personal level as an individual but on the collective as a citizen The "conflict" between the individual and the collective is expressed in "I win-you win-we win" (win - win - win)

Social contracts are made by the people for the people in citizenship Because "negotiation" is at the heart of our lives, win-win- win agreements are much more powerful, covering both the "legal" and the "moral" » of everyday life

In Rousseau's concept of "citizen" individualism, empathy, and communitarianism come together. They are exactly the three elements that project win-win-win. At a later stage, we can say that perpetual accumulation is no longer the great goal. It makes no sense to unbridled individualism It is increasingly realized that individualism must be connected to empathy to make any human sense (win-win) Nash comes to the same conclusion as [59] strategic and political thought (win-win)

If the concept of "citizen" is not deeply understood then the third "we win" represents the completed version of the negotiation, which coincides with the mental completion

Economic, social and cultural rights have always been overwhelmed by classical rights and freedoms.

The third "we win" represents all those classic rights and freedoms , the third we win points the way to freedom

◉◉◉

11. Win - win - win : Nash expansion

A three-person agreement problem consists of:

- A feasibility set F, a closed subset of R^3 often assumed to be convex, whose elements are interpreted as symposia.
- A dispute or threat, point d=(d1, d2, d 3), where d1 d2 and d3 are the respective payoffs to player 1 and player 2 and

player 3 that they are guaranteed to receive if they do not end up mutual agreement.
- The problem is not trivial if the agreements in F are better for both parties than the point of disagreement. One solution to the bargaining problem is to choose an F deal.

Expediency set

Feasible deals typically include all possible joint actions, leading to a feasibility set that includes all possible payoffs. Often, the feasible set is restricted to include only payoffs that have the potential to be better than the disagreement point for all three agents.

Point of disagreement

The disagreement point d is the value that the players can expect to receive if negotiations break down. This could be some focal balance that both players could expect to play. However, this point directly affects the bargaining solution, so it makes sense for each player to try to choose their point of disagreement in order to maximize their bargaining position. Toward this goal, it is often advantageous to increase the reward of one's dissent while harming the reward of the opponent's dissent (hence the interpretation of dissent as a threat). If threats are considered actions, then one can construct a separate game where each player chooses a threat and receives a reward depending on the outcome of the negotiation. It is known as Nash's variable threat game.

12. Nash bargaining game

John Forbes Nash was the first to study cooperative bargaining. His solution is called a Nash bargaining solution. It is the unique solution to a two-person bargaining problem that satisfies the axioms of scale invariance, symmetry, efficiency, and independence of unrelated alternatives. According to Walker, Nash's bargaining solution was shown by John Harsanyi to be the same as Zeuthen's solution to the bargaining problem.

The Bargaining Game (Nash extension) is a simple three-player game used to model bargaining interactions. In the Nash bargaining game, two players demand a share of some good (usually some amount of money). If the total amount requested by the players is less than what is available, both players receive their request. If their total request is greater than what is available, no player receives their request.

Nash (1953) presents a non-cooperative demand game with two players who are uncertain about which payoff pairs are feasible. At the limit as uncertainty disappears, equilibrium payoffs converge to those predicted by the Nash bargaining solution

Equilibrium analysis

Strategies are represented in the Nash demand game by a pair (x, y). x and y are chosen from the interval [d, z], where d

is the dispute result and z is the total amount of the good. If x + y is equal to or less than z, the first player gets x the second y and the third z Otherwise all three get d, often d=0.

There are many Nash equilibria in the demand game Any x and y such that x + y+ z = φ in 3D space is a Nash equilibrium. If either player increases their bid, both players receive nothing. If either reduces their demand, they get less than if they had demanded x or y, or z There is also a Nash equilibrium where both players demand the entire good. Here both players receive nothing, but neither player can increase their payoff by unilaterally changing their strategy.

Nash bargaining solution

John Forbes Nash Jr. suggested that a solution should satisfy certain axioms:

- Invariant to affine transformations or Invariant to equivalent utility representations
- Pareto optimality
- Independence of unrelated alternatives
- Symmetry

The solutions satisfying these axioms are exactly the points x,y, z) in F that maximize the following expression:

(u(x)-u(d))(v(y)-v(d))(z(x)-z(d))

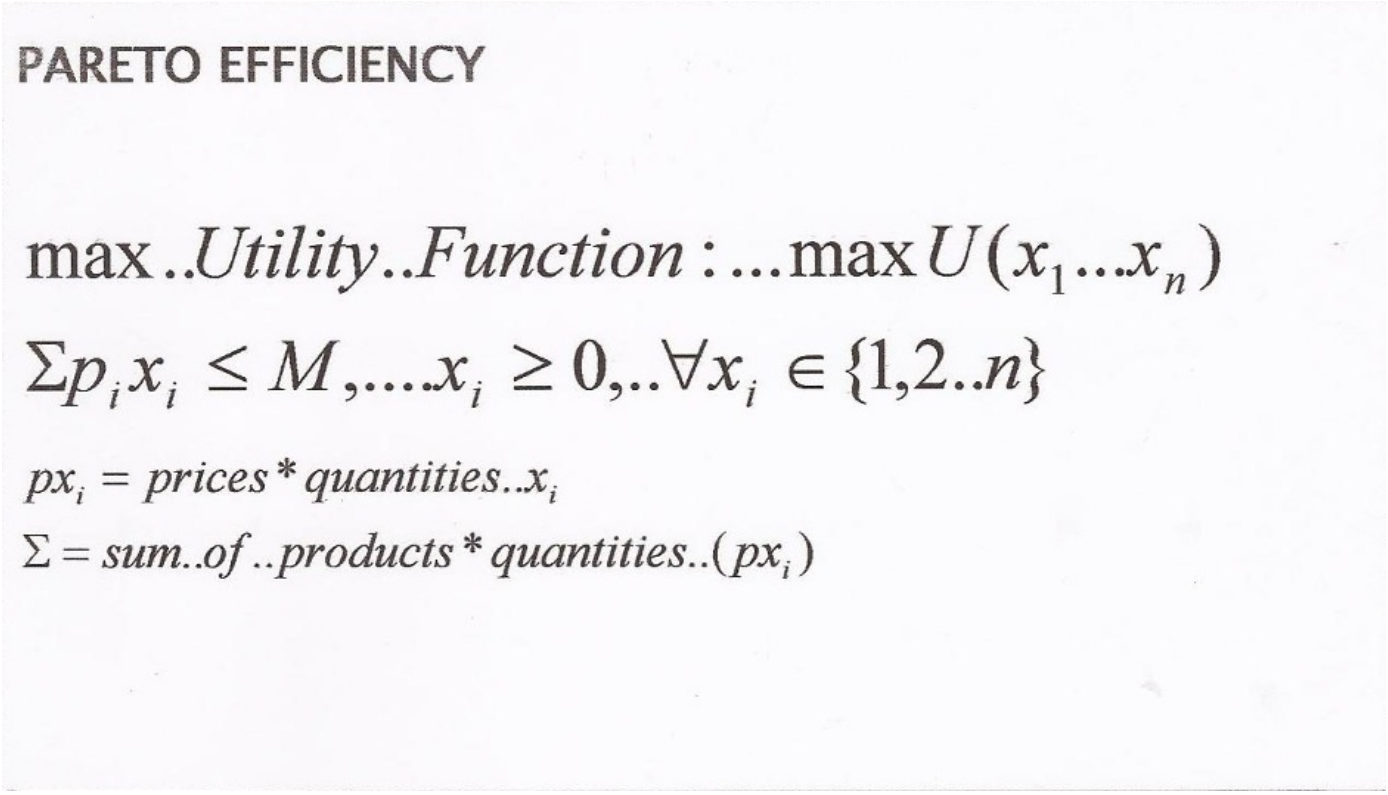
where uv, z are the helper functions of player 1 player 2 and player 3 respectively, and d is a conflict result. That is, players act as if they seek to maximize (u(x)-u(d))(v(y)-v(d))(z (x)- z (d)) where u (d) v (d) and z(d) are the status quo utilities (the utility obtained if one decides not to negotiate with the other player). The product of the two excess utilities is generally referred to as the Nash product. Intuitively, the solution is for each player to receive their status quo payoff (i.e., the noncooperative payoff) in addition to their share of the benefits from cooperation

Below, a win - win - win distributive rather than comprehensive potential trade-off is given

13. PARETO choice

PARETO EFFICIENCY - also referred to as allocative efficiency -**occurs when resources are so allocated that it is not possible to make anyone better off without making someone else worse off**

Our FIRST approach focuses on "Pareto Efficiency", in relation with the achievement (step-by-step) of profit/utility maximization at the individual (and social) level in the case of the distribution of a limited resource



$U = u * p$
$U_A = u_a * p_a$
$U_B = u_b * p_b$
$U_C = u_c * p_c$
$U_A = x, U_B = y, U_C = 100 - xy$
$U_A * U_B * U_C = \max$, then $(U_A * U_B * U_C)' = 0$

$xy(100 - xy)^n = \max$, then $\left[xy(100 - xy)^n\right]' = 0$

$(f(x) \cdot g(x))' = \dot{f}(x)g(x) + f(x) \cdot g'(x)$

$$\left(\frac{f(x)}{g(x)}\right)' = \frac{\dot{f}(x) \cdot g(x) - f(x) \cdot g'(x)}{(g(x))^2}$$

$\left[xy\,(100 - xy)^n\right]' = 0$

$= y\,(100 - xy)^n + x\,(100 - xy)^n + nxy\,(100 - xy)^{n-1} = 0$
$= y\,(100 - xy)^{n-1}(100 - xy) + x\,(100 - xy)^{n-1}(100 - xy) + nxy\,(100 - xy)^{n-1}$
Assume $(100 - x - y)\#0$ Divide $:(100 - x - y)^{n-1}$
$y\,(100 - xy) + x\,(100 - xy) + nxy * 1 = 0xy\#0$
$x + y\,(100 - xy) + nxy = 0 : xy$
$x + y/xy\,(100 - xy) + n = 0$
$x + y/xy\,(100 - xy) = -n$
we set $x + y/xy = k$
$k\,(100 - x - y) = -n$
$100 - x - y = -n1/k$

But **(100 - x - y)**is the COMMUNITY share, **“ c ”** so

c = - n (1/k)

the **- n** denotes the decrease in the shares of the other 2 negotiators from the Community reaction

The point x % of – n shows the equilibrium value

If

k=1, then x*%=n/1=100%=max inequality (100-0-0)

k=2, then, x*%=n/2%=50 (inequality (50-50-0)

k=3 then x*%=n/3=33.333 ideal situation

k=4, then x*%=unstable (Theoharis oscillation of A,B,C)

Papaconstantinidis 2015

Every action we take changes the world and thus limits the range of possible actions for others. To understand the social limits on leverage in bargaining, we need—among others—a theory that links distributive—or even better—integrative justice to the form of bargaining. Because people "punish" negotiators who treat them unfairly avoiding future negotiations with these unfair negotiators, we conclude that a negotiation that takes social impact seriously is acceptable and sought after

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14. CORRELATION

The specific analysis concerns the verification of the existence of a correlation between two scale/ordinal variables. Our analysis shows whether there is statistical evidence that the correlation exists as well as the direction and intensity of the relationship between the variables. Hypothesis testing The $_0$: there is no correlation between the variables (r=0) The$_1$: there is a correlation between the variables (r not 0) Analysis Result Interpretation of statistical significance - If the value of Sig. (2-tailed) is sig. 0.05 then we accept the null hypothesis, that is there is a linear relationship between the variables (r not 0). Interpretation of the r index The r index shows us the intensity and direction of the above linear relationship. If it is not statistically significant, we obviously do not comment on it. Direction (sign): It can take a positive or negative sign, showing that this relationship is positive (eg when satisfaction increases for each of the service characteristics, overall satisfaction also increases) or negative (eg when satisfaction increases for each of service characteristics decreases

overall satisfaction). Intensity (absolute value): - r < 0.3 No or very weak correlation - 0.3 < r < r < 0.7 Moderate - r > 0.7 Strong - r = 1 Absolute Command in SPSS Analyze -> Correlate -> Bivariate In our example we select the scale variables in the Variables column and check the Pearson option.

15. STUDY-1

Method

Participants

A total of 329 volunteer participants participated in the study and 320 valid participants were obtained, including 102 men and 218 women. Here, 201 participants were residents of urban areas and 119 participants were residents of rural areas. Regarding education, 48 participants had a master's degree or higher, 223 participants had a bachelor's degree, 35 participants had a master's degree, nine participants had a high school degree, and five participants had a high school degree or less. Among them, 237 participants were full-time students and 103 participants had work experience.

Materials

Based on previous research (Zhang and Zhang, 2020), 50 items were collected in the original win-win questionnaire, reviewed by several graduate students and professional psychology major mentors to refine the items.

The original questionnaire consisted of one polygraph question ("I have never cheated on anyone.") and nine reverse items. The questionnaire was a self-rated 5-point Likert scale (1 = “strongly disagree”, 2 = “somewhat disagree”, 3 = “not sure”, 4 = “somewhat agree” and 5 = “strongly agree”).

Procedure

Participants volunteered to complete the questionnaire on the website from March to April 2020. Participants were asked to select the most appropriate situation for themselves by reading the description of each sentence. SPSS 22.0 software was used for data analysis and exploratory factor analysis (EFA).

Results

Object analysis

Prior to EFA[60], we used factor analysis (Wu, 2010)[61] for the preliminary selection of items, and the following two steps were performed: (1) Checking the data file to ensure that the data could be analyzed under the usual conditions in case of any error value or missing value. (2) Numerical conversion of inverses, recording and grading of inverses, and assigning new values to old ones.

After removing the polygraph item, 49 items were examined by factor analysis. First, the data were divided into high and low groups for independent sample t-test using the critical ratio method. The criteria for deletion were as follows: (1) The critical value was not significant ($p > 0.05$); (2) The t statistic of the difference between high and low item groups was lower than 3 ($t < 3$). The results showed that item 35 ($t = –0.279$, $p = 0.781$), item 49 ($t = 1.572$, $p = 0.118$), item 24 ($t = –2.808$, $p = 0.006$), item 38 ($t = 2.849$, $p = 0.005$) and item 47 ($t = 2.961$, $p = 0.003$) did not conform to the standard, so they were deleted (Wu, 2010).

In addition, the correlation between the item score and the total score was calculated before examining the items. Based on the Pearson correlation coefficient, the criteria for deletion were as follows: (1) The correlation between the items and the total scale was not significant ($p > 0.05$). (2) The correlation coefficient (r) between the item score and the total score was lower than 0.4. The result showed that item 9 ($r = 0.395$, $p < 0.05$), item 15 ($r = 0.395$, $p < 0.05$), item 24 ($r = –0.185$, $p < 0.05$), item 20 ($r = 0.399$, $p < 0.05$), item 28 ($r = 0.269$, $p < 0.05$), item 35 ($r = 0.013$, $p = 0.811$), item 38 ($r = 0.132$, $p < 0.05$), item 45 ($r = 0.336$, p) < 00. , item 47 ($r = 0.202$, $p < 0.05$) and item 49 ($r = 0.067$, $p = 0.232$) were not consistent with standard, so these items were deleted.

Discussion

The aim of the present study was to develop and validate a win-win scale. Our preliminary research (Zhang and Zhang, 2020) first used an open-ended questionnaire survey, and 29 feature words for win-win were obtained. Then, a cluster analysis study was conducted based on a questionnaire survey using a 5-point Likert rating and five win-win constructs were obtained. Based on pilot research (Zhang and Zhang, 2020), 50 items were formulated to explore the psychological construct of win-win in the current study. Using item analysis, EFA, and CFA, 25 items remained and five dimensions (integrity, progress, altruism, harmony, and coordination) were constructed. To ensure the simplicity of the model in the CFA phase, nine items were deleted according to the MI indices and fit scores. Finally, 16 items were obtained and the five-dimension win-win model fits well. The reliability and validity of our scale met the criteria. Therefore, our study verified the results of Zhang and Zhang (2020) and contributed to win-win measurement for theoretical and practical application.

Our results revealed that the win-win scale contained**five dimensions, including integrity, progress, altruism, harmony, and coordination** . Integrity is one of the primary bonds of interpersonal communication (Zhang and Zhong, 2017). Only with integrity can we achieve win-win. Progress is presented as the desire for progress or a tendency to grow. If people have high demands on themselves, then they will be able to deal positively with various conflicts and problems (Vera et al., 2004; Desivilya and Eizen, 2005), which can be beneficial for realizing win-win . Harmoniousness affects people's social communication and interaction (Gabrenya and Hwang, 1996). Harmony does not mean blindly avoiding conflict. defined as the combination and unified coexistence of different things. Only mutual respect and inclusion can achieve win-win. The core content of altruism is metaphysical thinking instead of paying attention to yourself without the thoughts of others. If one cares only blindly for his personal interests, it will result in a miserable end. A better end of win-win requires joint development and care of others. The last dimension is coordination, which reflects a win-win for two or more people working together rather than just one person struggling. In summary, our results showed that the five

dimensions were necessary for win-win.

Win-win is the realization of self-interest and mutual benefit. Stakeholders will gain from cooperation and lose from confrontation. Win-win was considered as a value orientation derived from Chinese traditional culture (Sima, 1956; Zhang, 1996) and generalized across cultural settings. "Doctrine of the mean" and "great harmony" embody the essential features of coexistence and mutual prosperity. Win-win is the best situation that different stakeholders can achieve. The current study was the first to develop a research-based win-win scale for cooperation, trust, and prosocial behavior (Smith, 2015; Duijf, 2018; Zlatev, 2019) and extended existing research. In addition, the present study was of great value in promoting the harmonious development of people and providing new perspectives for creating a community of shared future.

Limitations and Future Directions

The present study is still at a preliminary stage in the psychological discipline. There are still some limitations. First, there may be sampling bias. There was an imbalance between gender and education in the sample size in this study. Although previous studies have shown measurement invariance across grade and gender for some scales (e.g., Harter, 1982; Cheung and Rensvold, 2002; Kim et al., 2019), the unbalanced number of participants across gender/education levels may still affect our results. Future studies should obtain a balanced sample to further test the win-win scale. Second, there may be a social desirability effect on the self-administered questionnaire. Future studies could use other research methods (eg, field research) to validate our results. Finally, it would also be important to investigate whether there is a difference in win-win values between different groups, which is useful to verify the reliability and validity of the current scale.

Conclusion

The win-win scale contained five dimensions, including**integrity, progress, altruism, harmony, and coordination**. It proved to be a reliable and valid tool for win-win measurement.

16. ME 2

Introductions - THEORETICAL BASIS

Likert scale

The Likert scale is an opinion or behavior rating scale. This is a subcategory of the ordinal scale. In educational assessment it is used when the examinee is assessed by expressing the degree (how well) of the assessor's satisfaction with the manner in which the examinee carried out a task he was asked to perform.

More specifically, the evaluator has a list of propositions (affirmative or interrogative), the number of which usually varies from six to thirty (Arnold et al. 1967:31). The statements are accompanied by closed-ended responses, which are usually

given in the form of a 3- to 7-point scale and indicate varying degrees of agreement or satisfaction. The scale rating usually uses one of the following groups of options: (a) "Disagree", "Probably disagree", "Neither agree nor disagree", "Probably agree", "Agree" and (b) "Not at all satisfactory", " Somewhat satisfactory', 'Moderately satisfactory', 'Very satisfactory', 'Fully satisfactory'. The participant/evaluator is invited to note the degree of agreement or disagreement with each proposal.

The criteria used, i.e. the sentences to which the above tiers correspond, are important to be short, clear and written in understandable language, to not contain generalities and to cover the entire scope under consideration.

The Likert scale is a practical and quick tool for evaluating a course. It is used more for students to evaluate the course and the teacher than for teachers to evaluate student performance. Students can evaluate various aspects of teaching, from the content of a lesson to the preparation of the teacher, within a relatively short period of time. Also, these types of scales are preferred by evaluators, as the final result of the evaluation results from the degree of satisfaction and can be communicated even to stakeholders who are not specifically trained in statistics (Spooren et al. 2007:669).

However, the Likert scale also has some disadvantages: First, the way the statements are worded is very likely to influence the participants' responses (Hasson & Arnetz 2007:2). Second, the range of answers may on the one hand make it difficult for some of the participants to choose a single answer, on the other hand it may seem restrictive to some others. In both cases, participants are forced to choose an answer that does not express their true intention. Third, the overall rating obtained from a Likert scale is the result of many different combinations of ratings, which leads to a loss of information. Fourth, the use of summative scoring results is likely to lead to erroneous conclusions. Finally, when there are answers in the middle of the scale indicating neutrality (“Neither agree nor disagree”), participants may be driven to neutrality and indecision, to avoid choosing an extreme answer. This can lead to an inability to capture the possible views and reactions and affect the reliability of the results. For this reason, it has been proposed to exclude neutrality responses, which again may have a negative effect on the reliability of the results, as participants, not having the option to remain neutral, are forced to either agree or disagree.

A Likert scale is a closed-ended, forced-choice scale used in a questionnaire that provides a range of responses that go from one extreme to the other. For example, a scale could have five options starting at one end with "strongly agree" and ending at the other with "strongly disagree", with less extreme options in the middle three points. Likert scales are widely used in psychology and other social science research.

Major improvements: Likert scales

- A Likert scale allows respondents to choose from a linear set of responses that increase or decrease in intensity or endurance. It is a closed type, mandatory choice of scale.
- Widely used in psychological and other social science research today, Likert scales allow researchers to collect data that provides nuance and insight into participants' opinions. These data are quantitative and can be easily analyzed statistically.
- Likert items often offer response categories on a 1-to-5 scale, but a range of options are possible, including 1-to-7 and

0-to-4 scales, or even scales that typically range from 1-to-4 or 1-to-6.

Creating the Likert scale[62]

The Likert scale was developed by American psychologist **Rensis Likert** in 1932. Likert wanted to find a way to systematically measure individual behaviors. His solution was the scale that today bears his name.

Likert scales offer a continuum or series of usually seven to five fixed-choice options. This allows people to self-report the extent to which they agree or disagree with a particular statement. As a result, Likert scales allow for more nuance than a simple binary response, such as a yes or a no. This is why Likert scales are often used to collect data in psychological research.

Likert format Scale

You know you're filling out a Likert scale if you're asked to give an opinion in response to a statement, choosing from a series of options that allow you to rate your degree of agreement. Sometimes, instead of a statement, the item will be a question. The most important thing to note, however, is that the options from which to choose your answer offer a range of non-overlapping views.

Likert scales create a linear series of responses that increase or decrease in intensity or endurance. These response categories are open to respondent interpretation. So, for example, one respondent may choose "agree" in response to a statement, while another feels the same way but chooses "strongly agree" instead. Regardless, the respondents and their data collection researchers understand that "strongly agree" is considered a more strongly positive choice than "agree".

While it is more common to see Likert scales that include 5 to 7 choices for a response, sometimes a researcher will use more. Nevertheless, it is already observed that when people are presented with a greater number of answer options they do not tend to choose the answers at the two ends of the scale. Perhaps on a large scale the endpoint options seem too extreme.

A scale with an odd number of response categories has a center point that should be considered neutral. If a researcher wants to force a respondent to choose whether to touch one way or the other on a question, he can eliminate the neutral option, using a scale with an even number of options.

Examples

Here are some examples of Likert items from real psychological questionnaires.

From the Big 5 Personality Meet Short Questionnaire:

I see her as someone who is full of energy, always wants to be active.

0. I strongly disagree

1. I disagree a bit

2. Neutral opinion

3. I somewhat agree

4. I totally agree

From Meaning in Life Questionnaire:

I am one who is always looking to find my life's purpose

1. Absolutely untrue

2. Mostly untrue

3. Somewhat untrue

4. I can't say true or false

5. Somewhat true

6. Mostly true

7. Absolutely true

From the BBC Wellbeing Scale:

Do you feel in control of your life?

1. Not at all

2. A little

3. Medium

4. Too much

5. Excellent

Likert scales can be used to ask about a wide range of behaviors, apart from agreement. In addition to the above examples, Likert items can ask how often a person does something (endpoints for a frequency item will be "very often" and "never"), how important a person thinks something is to them (finally points for the importance of the item will be "very important" and "not very important"), and how much something is liked (end points for an item preferences will be "very" and "not at all").

17. X^2 test

Theoretical level

Chi - square test of goodness of fit goodness - of - fit test[63])

From the point of view of Statistics, where our starting point is the sample, the corresponding request is the control of the parameters ρ_1 , p_2 ,..., p_k (of a polynomial distribution) based on a sample available to us.

So suppose we have at our disposal a sample of n observations from which n_1 are classified in the category r_1 , n_2 in the category r_2 , ..., and v_k in

category r_k , or otherwise, let it be that in n independent replicates of a polynomial test, we observed that the results r_1, r_2 ,..., r_k appeared with frequencies v_1 , v_2 , ... , v_k , respectively. What can we say, based on this empirical frequency distribution, about the probabilities p_1 , p_2 ,..., p_k display the results r_1 , r_2 , ..., r_k , respectively. Do they arise from some model (probability distribution) that we assume (and set as the null hypothesis) or do they follow some other model?

The hypothetical probability model (probability distribution) that we set as the null hypothesis and want to test whether it agrees/fits the experimental data at our disposal may be perfectly defined, i.e. there may be no unknown parameters, however, there may be some unknown parameters to be estimated

As a statistical control function (control function) the statistical function X (Pearson 's chi - square test statistic) suggested by Karl Pearson in 1900, and is defined by type

$$x^2 = \Sigma(O_i - E_i)^2 / E_i$$

where, O_1 ,0_2 , ..., O_k are the observed frequencies (observed frequencies) of the results r_1 , r_2 ,..., r_k respectively **,** and E_1 , E_2 , **.,** E_k are the corresponding expected frequencies (expected frequencies) based on the null hypothesis, or otherwise **,** on the condition that the null hypothesis is true**,** As we will see below, what is tested in all three test cases , is the **statistical significance of the deviations (differences) between frequencies observed in the sample and frequencies that expected based on zero**

To ensure that the sample size n (the number of replicates) is large enough for this approximation to be satisfactory, all expected frequencies must be greater than or equal to 5, i.e.,

$$E_i = vp_{io}$$

$E_t = vp_{i\,0} > 5$, for each i = 1,2,., k

We test the null hypothesis at the $\alpha = 0.05$ significance level

H_0 : The random variable Y follows the Poisson distribution with λ = 1 against the alternative denote by O_{ij} the number of experimental units (out of v) classified in the category (A_t , B_j), or otherwise, let O_{ij} the frequency of the category (A_i , B_j). The Table whose lines are defined by r classes A_1 , A_2 ,..., A_r of feature A and its columns from c categories B_1 , B_2 ,..., B_c of feature B, and which, as an element at position (i , j) (ie in the cell defined by line i and column j) has frequency O_{ij} of the corresponding class, i.e. the frequency of the class (A_i , B_j), is a rxc two-dimensional frequency table called the contingency table table).

		Χαρακτηριστικό B				
		B_1	B_2	...	B_c	Σύνολα γραμμών
Χαρακτηριστικό A	A_1	O_{11}	O_{12}	...	O_{1c}	R_1
	A_2	O_{21}	O_{22}	...	O_{2c}	R_2
	⋮	⋮	⋮		⋮	⋮
	A_r	O_{r1}	O_{r2}	...	O_{rc}	R_r
Σύνολα στηλών		C_1	C_2	...	C_c	v

Such a frequency matrix is called a correlation matrix because through the two-dimensional frequency distribution that it represents/describes, we check whether the two characteristics that define its dimensions have some relevance/dependence or whether they are independent. That is why such a classification is (usually) made. To check whether two characteristics (variables) whose values are classified into categories, are independent or whether they show some relation/dependence. To test, for example, whether a person's resistance to the flu virus (got sick, didn't get sick) depends on the number of doses of flu vaccine they received (0 , 1 , 2) or if there is a correlation/dependence between gender (male, female)) and smoking habit (non-smoker, ex-smoker, occasional smoker, smoker) or whether the way students get to the university (on foot, by bike, by car or motorcycle, by public transport, by taxi) is independent of gender (male, female) or if the resistance of a plant to a certain disease (got, didn't get) depends on its size (big, small). So let's see how we can do such an independence check.

Let a random sample of n observations (A ,. , B_j) obtained from the

classification of n experimental/sampling units by two

attributes A and B, of which, A can take r > 2 different values (categories), A_1 , A_2 ,..., A_r , and B can take c > 2 different values (categories), B_1 , B_2 ,..., B_c . It is logical/reasonable that the independence of A and B should

is defined through the concept of contingency independence. Indeed, it is. If we consider the possibilities

A_i : an experimental unit is classified in class A_t of characteristic A

B_j : an experimental unit is classified in category B_j of feature B then features A and B are independent if the contingencies A_i and B_j are independent for each i = 1 , 2 ,..., r and j = 1 , 2 ,..., c , that is, if P ($A_i \cap B_j$) = P (A_i) P (B_j) , for all i and j or equivalent, if

P (A_t | B_j) = P (A_t), for all i and j .

This means that features A and B are independent if, for all i and j , the probability that an observation belongs to category A_i of characteristic A

not dependent/not affected by category B_j of characteristic B in

which belongs, or equivalently, if, for all i and j , the probability that an observation belongs to category B_j of characteristic B is not dependent/not affected

from class A_i of the attribute A to which it belongs, since equivalent to the above relations (as we saw in Part A) is also the relation P (BjlAi) = P (Bj).

Control X^2 independence (chi-square test of independence)

Very often, in experimental or sampling surveys, an experimental/sampling unit is classified not only on one characteristic but also on a second one. Thus, two-dimensional data (bivariate data) which are presented in two-dimensional frequency tables called affinity tables.

Comment Let's see why the degrees of freedom of the χ^2 distribution used in the $\chi^{2\ test}$ of independence is (r - 1)(c -1).

In general, the degrees of freedom (b.e) in a control X^2 is

b.e. = number of different classes -1 - number of estimated parameters.

In the $X^{2\ control}$ of independence, as we have seen, the different categories are r c _ and the parameters that need to be estimated, when they are unknown to us, are the probabilities p_i and q_j . In total, the number of p_i and q_j which must be appreciated

is r -1 + c -1 (and not r + c) since the relations hold

Pi + p 2 + ··· + P r $=^{1\ and}$ q + q i + ··· + q r $=^1$.

So, we have

b.e = r c _ -1 - (r -1 + c - 1) = r · c - r - c +1 = (r - 1) · (c - 1)

If the parameters p_t and q_j are all known, then the degrees of freedom are obviously r c _ -1 - 0 = r · c -1.

Control X^2 homogeneity (chi-square test of homogeneity)\

A rxc affinity matrix, in general, results as we saw when n experimental[64] units (and correspondingly n observations) are simultaneously classified on two features in r - c categories according to a randomized experiment (n replications of a polynomial test with r - c different results/categories). This means that each experimental unit can be classified into any of the r - c categories and therefore, how many experimental units are sorted per row and how many per column of the table, i.e., the column and row sums are not fixed numbers but random variables. In such an experimental design, only the number of replications n , that is, the sample size n , is predetermined .

18. Research

1-1-2021 UNTIL 31-12-2021

Sex respondents			
	MEN	WOMEN	total
Urban areas	548	592	1140

Age of respondents	
AGE GROUP	FREQUENCY
• Under 12	-
• 12-17	
• 18-24	
• 25-34	324
• 35-44	236
• 45-54	155
• 55-64	215
• 65-74	210
• 75+	
• Total	1140

	EDUCATIONAL LEVEL	MEN	WOMEN
1	PRIMARY SCHOOL GRADUATES	5	12
2	HIGH SCHOOL GRADUATES	345	342
3	UNIVERSITY GRADUATES	119	149
5	MASTER'S DEGREE	70	7 8
6	DOCTORATE HOLDERS	8	11
7	POST-DOC	1	-
	total	548	592

QUESTIONNAIRE

Close Ended Questions					
	intensity				
	I strongly disagree	Disagree	I do not care	Agree	I totally agree
You only consider personal gain					
Consider the benefit of other negotiators					
Consider the overall benefit					

Behavior in negotiation							
		I strongly disagree	Disagree	neutral	agree	I totally agree	total
1.1	You only consider personal gain	40	85	80	100	80	385
1.2	Consider the benefit of other negotiators	55	35	120	105	84	399
1.3	Consider the overall benefit	72	79	70	80	55	356
total	total	167	199	270	285	219	1140

EXPECTED PRICES

$$E = \frac{(row..total)(column..total)}{grand..total}$$

	I strongly disagree	Disagree	neutral	agree	I totally agree
You only consider personal gain	56.4	67.2	91.18	96.25	73.96
Consider the benefit of other negotiators	58.45	69.65	94.5	99.75	76.65
Consider the overall benefit	52.15	62.14	84.31	89.00	68.9

ΠΑΡΑΤΗΡΟΥΜΕΝΕΣ – ΠΡΟΣΔΟΚΟΜΕΝΕΣ...ΣΥΧΝΟΤΗΤΕΣ

OBSERVED(OBS)..FREQUENCES – EXPECTED(EXP)...FREQUENES

$$(obs - \exp)^2 / \exp$$

$$\chi_c^{\,2} = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

	I strongly disagree	Disagree	neutral	agree	I totally agree
You only consider personal gain	40-56.4	85-67.2	80-91,18	100-96.25	80-73.96
Consider the benefit of other negotiators	55-58,45	35-69.65	120-94.5	105-99.75	84-76,65
Consider the overall benefit	72-52,15	79-62,14	70-84,31	80-89.00	55-68.9

$$(obs - \exp)^2 / \exp$$

$$\chi_c^{\,2} = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

$$\frac{(40-56{,}4)^2}{56{,}4} + \frac{(85-67{,}2)^2}{67{,}2} + \frac{(80-91{,}8)^2}{91{,}18} + \frac{(100-96{,}25)^2}{96{,}25} + \frac{(80-73{,}96)^2}{73{,}96}$$

4.76+4.71 +1.52 +0.15+0.081= **11.221**

Critical value

Critical values								
n	**α = 0·995**	**α = 0·99**	**α = 0·975**	**α = 0·95**	**α = 0·05**	**α = 0·025**	**α = 0·01**	**α = 0·005**
1	0,000	0,000	0.001	0.004	3,841	5,024	6,635	7,879
2	0.010	0.020	0.051	0.103	5,991	7,378	9,210	10,597
3	0.072	0.115	0.216	0.352	7,815	9,348	11,345	12,838
4	0.207	0.297	0.484	0.711	9,488	11.143	13,277	14,860
5	0.412	0.554	0.831	1,145	11,070	12,832	15,086	16,750
6	0.676	0.872	1,237	1,635	12,592	14,449	16,812	18,548
7	0.989	1,239	1,690	2,167	14,067	16,013	18,475	20,278
8	1,344	1,647	2,180	2,733	**15,507**	17. 5 35	20,090	21,955
9	1,735	2,088	2,700	3,325	16,919	19,023	21,888	23,589
10	2.156	2,558	3.247	3,940	18,307	20,483	23.209	25,188
11	2,603	3,053	3,816	4,575	19,675	21,920	24,725	26,757
12	3,074	3,571	4.404	5.226	21,026	23,337	26,217	28,300
13	3,565	4.107	5,009	5,892	22,362	24,736	27,888	29,819
14	4,075	4,660	5,629	6,571	23,685	26,119	29.141	31,319
15	4.601	5,229	6.262	7.261	24,996	27,488	30,578	32,801
16	5.142	5,812	6,908	7,962	26,296	28,845	32,000	34,267
17	5,697	6,408	7,564	8,672	27,587	30.191	33,409	35,718
18	6,265	7,015	8.231	9,390	28,869	31,526	34,805	37,156
19	6,844	7,633	8,907	10.117	30,144	32,852	36.191	38,582
20	7,434	8,260	9,591	10,851	31,414	34,170	37,566	39,997
21	8,034	8,897	10,283	11,591	32,671	35,479	38,932	41.401
22	8,643	9,542	10,982	12,338	33,924	36,781	40,289	42,796
23	9,260	10,196	11,689	13,091	35,172	38,076	41,638	44.181
24	9,886	10,856	12.401	13,848	36,415	39,364	42,980	45,558
25	10,520	11,524	13,120	14,611	37,652	40,646	44,314	46,928
26	11,160	12,198	13,844	15,379	38,885	41,923	45,642	48,290
27	11,808	12,878	14,573	16.151	40,113	43.194	46,963	49,645
28	12,461	13,565	15,308	16,928	41,337	44,461	48,278	50,994
29	13.121	14,256	16,047	17,708	42,557	45,722	49,588	52,335
30	13,787	14,953	16,791	18,493	43,773	46,979	50,892	53,672
40	20,706	22,164	24.4331	26,509	55,756	59,342	63,691	66,766
50	27,991	29,708	32.3574	34,764	67,505	71,420	76,154	79,490
60	35,535	37,485	40.4817	43,188	79,082	83,298	88,379	91,952
70	43,275	45,442	48.7576	51,739	90,531	95,023	100,425	104.215
80	51,172	53,540	57.1532	60,392	101,879	106,629	112,329	116,321
90	59,196	61,754	65.6466	69,126	113.145	118,136	124,116	128,299
100	67,328	70,065	74.2219	77,930	124,342	129,561	135,807	140,169

		I strongly disagree	Disagree	neutral	agree	I totally agree
1.1	You only consider personal gain	40-56.4	85-67.2	80-91,18	100-96.25	80-73.96

CHECK OF NULL HYPOTHESIS H_0

For significance level, a=0.05 and $(c-1)(r-1)=(5-1)(3-1)=8$ ***...df degrees of freedom we have***

$\chi^2_{calcul} = 11,221 \prec \chi^2_{critical} =$ *15,507*

The rejection region of the control is defined by the inequality

$$\chi^2_{calcul} = 11,221 \prec \chi^2_{critical} = 15,507$$

and because $11,221 \prec 15,507$ that is, because the value of the statistical control function belongs to the rejection region, the null hypothesis, at a significance level of 0.05 is rejected. The probability that this conclusion is wrong is at most 0.05

This means that is H_0 ***rejected, which in turn means that its alternative*** H_1 ***is accepted***

//

1.2	Consider the benefit of other negotiators	55-58,45	35-69.65	120-94.5	105-99.75	84-76,65

Critical values

n	α = 0·995	α = 0·99	α = 0·975	α = 0·95	α = 0·05	α = 0·025	α = 0·01	α = 0·005
1	0,000	0,000	0.001	0.004	3,841	5,024	6,635	7,879
2	0.010	0.020	0.051	0.103	5,991	7,378	9,210	10,597
3	0.072	0.115	0.216	0.352	7,815	9,348	11,345	12,838
4	0.207	0.297	0.484	0.711	9,488	11.143	13,277	14,860
5	0.412	0.554	0.831	1,145	11,070	12,832	15,086	16,750
6	0.676	0.872	1,237	1,635	12,592	14,449	16,812	18,548
7	0.989	1,239	1,690	2,167	14,067	16,013	18,475	20,278
8	1,344	1,647	2,180	2,733	15,507	17. 5 35	20,090	21,955
9	1,735	2,088	2,700	3,325	16,919	19,023	21,888	23,589
10	2.156	2,558	3.247	3,940	18,307	20,483	23.209	25,188
11	2,603	3,053	3,816	4,575	19,675	21,920	24,725	26,757
12	3,074	3,571	4.404	5.226	21,026	23,337	26,217	28,300
13	3,565	4.107	5,009	5,892	22,362	24,736	27,888	29,819
14	4,075	4,660	5,629	6,571	23,685	26,119	29.141	31,319
15	4.601	5,229	6.262	7.261	24,996	27,488	30,578	32,801
16	5.142	5,812	6,908	7,962	26,296	28,845	32,000	34,267
17	5,697	6,408	7,564	8,672	27,587	30.191	33,409	35,718
18	6,265	7,015	8.231	9,390	28,869	31,526	34,805	37,156
19	6,844	7,633	8,907	10.117	30,144	32,852	36.191	38,582
20	7,434	8,260	9,591	10,851	31,414	34,170	37,566	39,997
21	8,034	8,897	10,283	11,591	32,671	35,479	38,932	41.401
22	8,643	9,542	10,982	12,338	33,924	36,781	40,289	42,796
23	9,260	10,196	11,689	13,091	35,172	38,076	41,638	44.181
24	9,886	10,856	12.401	13,848	36,415	39,364	42,980	45,558
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26	11,160	12,198	13,844	15,379	38,885	41,923	45,642	48,290
27	11,808	12,878	14,573	16.151	40,113	43.194	46,963	49,645
28	12,461	13,565	15,308	16,928	41,337	44,461	48,278	50,994
29	13.121	14,256	16,047	17,708	42,557	45,722	49,588	52,335
30	13,787	14,953	16,791	18,493	43,773	46,979	50,892	53,672
40	20,706	22,164	24.4331	26,509	55,756	59,342	63,691	66,766
50	27,991	29,708	32.3574	34,764	67,505	71,420	76,154	79,490
60	35,535	37,485	40.4817	43,188	79,082	83,298	88,379	91,952
70	43,275	45,442	48.7576	51,739	90,531	95,023	100,425	104.215
80	51,172	53,540	57.1532	60,392	101,879	106,629	112,329	116,321
90	59,196	61,754	65.6466	69,126	113.145	118,136	124,116	128,299
100	67,328	70,065	74.2219	77,930	124,342	129,561	135,807	140,169

The rejection region of the control is defined by the inequality

and because that is, because the value of the control statistic does not belong to the rejection region, the null hypothesis, at a significance level of 0.05 is accepted The probability that this conclusion is wrong is at most 0.05

1.3	Consider the overall benefit	**72-52,15**	**79-62,14**	**70-84,31**	**80-89.00**	**55-68.9**

Critical values

n	α = 0·995	α = 0·99	α = 0·975	α = 0·95	α = 0·05	α = 0·025	α = 0·01	α = 0·005
1	0,000	0,000	0.001	0.004	3,841	5,024	6,635	7,879
2	0.010	0.020	0.051	0.103	5,991	7,378	9,210	10,597
3	0.072	0.115	0.216	0.352	7,815	9,348	11,345	12,838
4	0.207	0.297	0.484	0.711	9,488	11.143	13,277	14,860
5	0.412	0.554	0.831	1,145	11,070	12,832	15,086	16,750
6	0.676	0.872	1,237	1,635	12,592	14,449	16,812	18,548
7	0.989	1,239	1,690	2,167	14,067	16,013	18,475	20,278
8	1,344	1,647	2,180	2,733	15,507	17. 5 35	20,090	21,955
9	1,735	2,088	2,700	3,325	16,919	19,023	21,888	23,589
10	2,156	2,558	3.247	3,940	18,307	20,483	23.209	25,188
11	2,603	3,053	3,816	4,575	19,675	21,920	24,725	26,757
12	3,074	3,571	4.404	5.226	21,026	23,337	26,217	28,300
13	3,565	4.107	5,009	5,892	22,362	24,736	27,888	29,819
14	4,075	4,660	5,629	6,571	23,685	26,119	29.141	31,319
15	4.601	5,229	6.262	7.261	24,996	27,488	30,578	32,801
16	5.142	5,812	6,908	7,962	26,296	28,845	32,000	34,267
17	5,697	6,408	7,564	8,672	27,587	30.191	33,409	35,718
18	6,265	7,015	8.231	9,390	28,869	31,526	34,805	37,156
19	6,844	7,633	8,907	10.117	30,144	32,852	36.191	38,582
20	7,434	8,260	9,591	10,851	31,414	34,170	37,566	39,997
21	8,034	8,897	10,283	11,591	32,671	35,479	38,932	41.401
22	8,643	9,542	10,982	12,338	33,924	36,781	40,289	42,796
23	9,260	10,196	11,689	13,091	35,172	38,076	41,638	44.181
24	9,886	10,856	12.401	13,848	36,415	39,364	42,980	45,558
25	10,520	11,524	13,120	14,611	37,652	40,646	44,314	46,928
26	11,160	12,198	13,844	15,379	38,885	41,923	45,642	48,290
27	11,808	12,878	14,573	16.151	40,113	43.194	46,963	49,645
28	12,461	13,565	15,308	16,928	41,337	44,461	48,278	50,994
29	13.121	14,256	16,047	17,708	42,557	45,722	49,588	52,335
30	13,787	14,953	16,791	18,493	43,773	46,979	50,892	53,672
40	20,706	22,164	24.4331	26,509	55,756	59,342	63,691	66,766
50	27,991	29,708	32.3574	34,764	67,505	71,420	76,154	79,490
60	35,535	37,485	40.4817	43,188	79,082	83,298	88,379	91,952
70	43,275	45,442	48.7576	51,739	90,531	95,023	100,425	104.215
80	51,172	53,540	57.1532	60,392	101,879	106,629	112,329	116,321
90	59,196	61,754	65.6466	69,126	113.145	118,136	124,116	128,299
100	67,328	70,065	74.2219	77,930	124,342	129,561	135,807	140,169

Because that is, because the value of the control statistic does not belong to the rejection region, the null hypothesis, at a significance level of 0.05 is accepted The probability that this conclusion is wrong is at most 0.05

		I strongly disagree	Disagree	neutral	agree	I totally agree	total	goodness of fit check
1.1	You consider only, personal benefit	40	85	80	100	80	385	The $_1$
1.2	Consider the benefit of other negotiators	55	35	120	105	84	399	The $_0$
1.3	Consider the overall benefit	72	79	70	80	55	356	The $_0$
total	total	167	199	270	285	219	1140	

This means that in questions 1.2 and 1.3the null hypothesis, at a significance level of 0.05 is accepted Since the null hypothesis is true, it is shown that the random variable , for large n follows a χ^2 distribution with k -1 degrees of freedom, that is, for large n, approximately we have that the control function quantifies (in a certain way) the deviations (differences) between observed and expected frequencies. We thus give an answer to a goodness - of - fit test tests). That is, goodness-of-fit tests enable us to test whether a probability distribution fits/fits the sample of 1140 respondents (chi - square goodness - of - fit test) [65].

From the above it follows that a **win - win - win negotiation** has two additional dimensions, namely **empathy and communalism.** The win-win scale contained five dimensions, such as integrity, progress, altruism, harmony and coordination. Thus we construct a model **of SEVEN (7) dimensions** , namely integrity, progress, altruism, harmony coordination, empathy and communityism It has proven to be a reliable and valid tool for measuring **win-win- win .**

19. STUDY 3

RESEARCH

1-1-2022 UNTIL 30-06-2022

Sex respondents

	MEN	WOMEN	total
Urban areas	492	350	842
Rural areas	271	232	503
total	763	582	1345

Age of respondents			
AGE GROUP	FREQUENCY	MEN	WOMEN
• Under 12	-	-	-
• 12-17	-	-	-
• 18-24	-	-	-
• 25-34	327	189	138
• 35-44	545	261	284
• 45-54	206	133	73
• 55-64	188	101	87
• 65-74	79	79	-
• 75+	-	-	-
• Total	1345	763	582

	EDUCATIONAL LEVEL	MEN	WOMEN	total
1	PRIMARY SCHOOL GRADUATES	18	32	50
2	HIGH SCHOOL GRADUATES	342	111	453
3	UNIVERSITY GRADUATES	325	355	680
5	MASTER'S DEGREE	71	79	150
6	DOCTORATE HOLDERS	6	5	11
7	POST-DOC	1	-	1
	total	763	582	1345

QUESTIONNAIRE

		I strongly disagree	Disagree	neutral	agree	I totally agree	total
1.1	Negotiation is an end in itself						
1.2	Negotiation is cooperation						
1.3	Negotiation is a function						
total	total						

OBSERVED PRICES							
		I strongly disagree	Disagree	neutral	agree	I totally agree	total
1.1	Negotiation is an end in itself	48	85	91	100	88	412
1.2	Negotiation is cooperation	31	51	77	112	111	382
1.3	Negotiation is a function	72	121	157	102	99	551
total	total	151	257	325	314	298	1345

EXPECTED PRICES

$$E = \frac{(row..total)(column..total)}{grand..total}$$

Negotiation is an end in itself	46.25	78,72	99.55	96.,8	91.28	412
Negotiation is cooperation	42.88	72.99	92.30	89.18	84.63	382
Negotiation is a function	61.85	105.28	133.14	128.63	66.02	551
total	151	257	325	314	298	1345

3rd step: $(O - E)^2$

Negotiation is an end in itself	48-46,25	85-78,72	91-99.55	100-96.,8	88-91,28
Negotiation is cooperation	31-42,88	51-72.99	77-92,30	112-89,18	111-84,63
Negotiation is a function	72-61.85	121-105,28	157-133,14	102-128,63	99-66.02

Negotiation is an end in itself	3.06	39.43	73.10	10.24	10.75
Negotiation is cooperation	141.13	483.56	234.09	520.75	695.37
Negotiation is a function	103.02	247.11	569.29	709.15	1087.68

4th step $\frac{(O_i - E_i)^2}{E_i}$

Negotiation is an end in itself	3.06 : 46.25	46.24 :78.72	73.10 : 99.55	10.24 : 96.8	10.75 : 91.28
Negotiation is cooperation	141.13 :42.88	483.56 : 72.99	234.09 : 92.30	520.75 : 89.18	695.37 : 84.63
Negotiation is a function	103.02 : 61.85	247.11 : 105.28	569.29 : 133.14	709.15 :128.63	1087.68 : 66.02

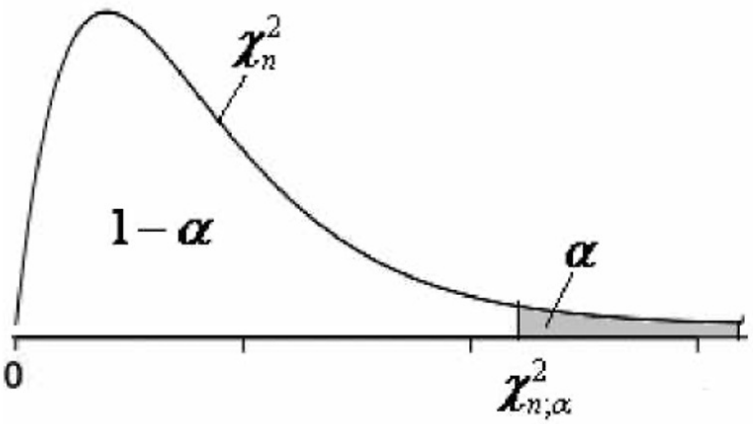
Negotiation is an end in itself	0.06	0.58	0.73	0.10	0.11
Negotiation is cooperation	3.29	6.62	2.53	5.84	8.21
Negotiation is a function	1.66	2.34	4.27	5.51	16.47

5th step $\_\chi_c^2 = \sum_{i=1}^{k} \frac{\left(O_i - E_i\right)^2}{E_i}$

Negotiation is an end in itself	1.58
Negotiation is cooperation	26.49
Negotiation is a function	30.25

CHECK OF NULL HYPOTHESIS H_0

For significance level, a=0.05 and $(c-1)(r-1)=(5-1)(3-1)=8...df$ ***degrees of freedom we have***



Level importance a

Critical values - Table

Critical values

n	*α = 0·995*	*α = 0·99*	*α = 0·975*	*α = 0·95*	*α = 0·05*	*α = 0·025*	*α = 0·01*	*α = 0·005*
1	*0,000*	*0,000*	*0.001*	*0.004*	*3,841*	*5,024*	*6,635*	*7,879*
2	*0.010*	*0.020*	*0.051*	*0.103*	*5,991*	*7,378*	*9,210*	*10,597*
3	*0.072*	*0.115*	*0.216*	*0.352*	*7,815*	*9,348*	*11,345*	*12,838*
4	*0.207*	*0.297*	*0.484*	*0.711*	*9,488*	*11.143*	*13,277*	*14,860*
5	*0.412*	*0.554*	*0.831*	*1,145*	*11,070*	*12,832*	*15,086*	*16,750*
6	*0.676*	*0.872*	*1,237*	*1,635*	*12,592*	*14,449*	*16,812*	*18,548*
7	*0.989*	*1,239*	*1,690*	*2,167*	*14,067*	*16,013*	*18,475*	*20,278*
8	*1,344*	*1,647*	*2,180*	*2,733*	***15,507***	*17. 5 35*	*20,090*	*21,955*
9	*1,735*	*2,088*	*2,700*	*3,325*	*16,919*	*19,023*	*21,888*	*23,589*
10	*2,156*	*2,558*	*3.247*	*3,940*	*18,307*	*20,483*	*23.209*	*25,188*
11	*2,603*	*3,053*	*3,816*	*4,575*	*19,675*	*21,920*	*24,725*	*26,757*
12	*3,074*	*3,571*	*4.404*	*5.226*	*21,026*	*23,337*	*26,217*	*28,300*
13	*3,565*	*4.107*	*5,009*	*5,892*	*22,362*	*24,736*	*27,888*	*29,819*
14	*4,075*	*4,660*	*5,629*	*6,571*	*23,685*	*26,119*	*29.141*	*31,319*
15	*4.601*	*5,229*	*6.262*	*7.261*	*24,996*	*27,488*	*30,578*	*32,801*
16	*5.142*	*5,812*	*6,908*	*7,962*	*26,296*	*28,845*	*32,000*	*34,267*
17	*5,697*	*6,408*	*7,564*	*8,672*	*27,587*	*30.191*	*33,409*	*35,718*
18	*6,265*	*7,015*	*8.231*	*9,390*	*28,869*	*31,526*	*34,805*	*37,156*
19	*6,844*	*7,633*	*8,907*	*10.117*	*30,144*	*32,852*	*36.191*	*38,582*
20	*7,434*	*8,260*	*9,591*	*10,851*	*31,414*	*34,170*	*37,566*	*39,997*
21	*8,034*	*8,897*	*10,283*	*11,591*	*32,671*	*35,479*	*38,932*	*41.401*
22	*8,643*	*9,542*	*10,982*	*12,338*	*33,924*	*36,781*	*40,289*	*42,796*
23	*9,260*	*10,196*	*11,689*	*13,091*	*35,172*	*38,076*	*41,638*	*44.181*
24	*9,886*	*10,856*	*12.401*	*13,848*	*36,415*	*39,364*	*42,980*	*45,558*
25	*10,520*	*11,524*	*13,120*	*14,611*	*37,652*	*40,646*	*44,314*	*46,928*
26	*11,160*	*12,198*	*13,844*	*15,379*	*38,885*	*41,923*	*45,642*	*48,290*
27	*11,808*	*12,878*	*14,573*	*16.151*	*40,113*	*43.194*	*46,963*	*49,645*
28	*12,461*	*13,565*	*15,308*	*16,928*	*41,337*	*44,461*	*48,278*	*50,994*
29	*13.121*	*14,256*	*16,047*	*17,708*	*42,557*	*45,722*	*49,588*	*52,335*
30	*13,787*	*14,953*	*16,791*	*18,493*	*43,773*	*46,979*	*50,892*	*53,672*
40	*20,706*	*22,164*	*24.4331*	*26,509*	*55,756*	*59,342*	*63,691*	*66,766*
50	*27,991*	*29,708*	*32.3574*	*34,764*	*67,505*	*71,420*	*76,154*	*79,490*
60	*35,535*	*37,485*	*40.4817*	*43,188*	*79,082*	*83,298*	*88,379*	*91,952*
70	*43,275*	*45,442*	*48.7576*	*51,739*	*90,531*	*95,023*	*100,425*	*104.215*
80	*51,172*	*53,540*	*57.1532*	*60,392*	*101,879*	*106,629*	*112,329*	*116,321*
90	*59,196*	*61,754*	*65.6466*	*69,126*	*113.145*	*118,136*	*124,116*	*128,299*
100	*67,328*	*70,065*	*74.2219*	*77,930*	*124,342*	*129,561*	*135,807*	*140,169*

For significance level α=0.05 and n = (r -1)(c -1) =8 the critical value with which χ^2 should be compared values calculated

are “15507”

A .- "Negotiation is an end in itself" (1.1)

Because the value of the control statistic is in the rejection region, the null hypothesis, at a significance level of 0.05, is NOT accepted. The probability that this conclusion is wrong is at most 0.05

B.- Negotiation is cooperation (1.2)

Because the value of the control statistic is NOT in the rejection region, the null hypothesis at the 0.05 significance level is accepted The probability that this conclusion is false is at most 0.05

C.- Negotiation is a function (1.3)

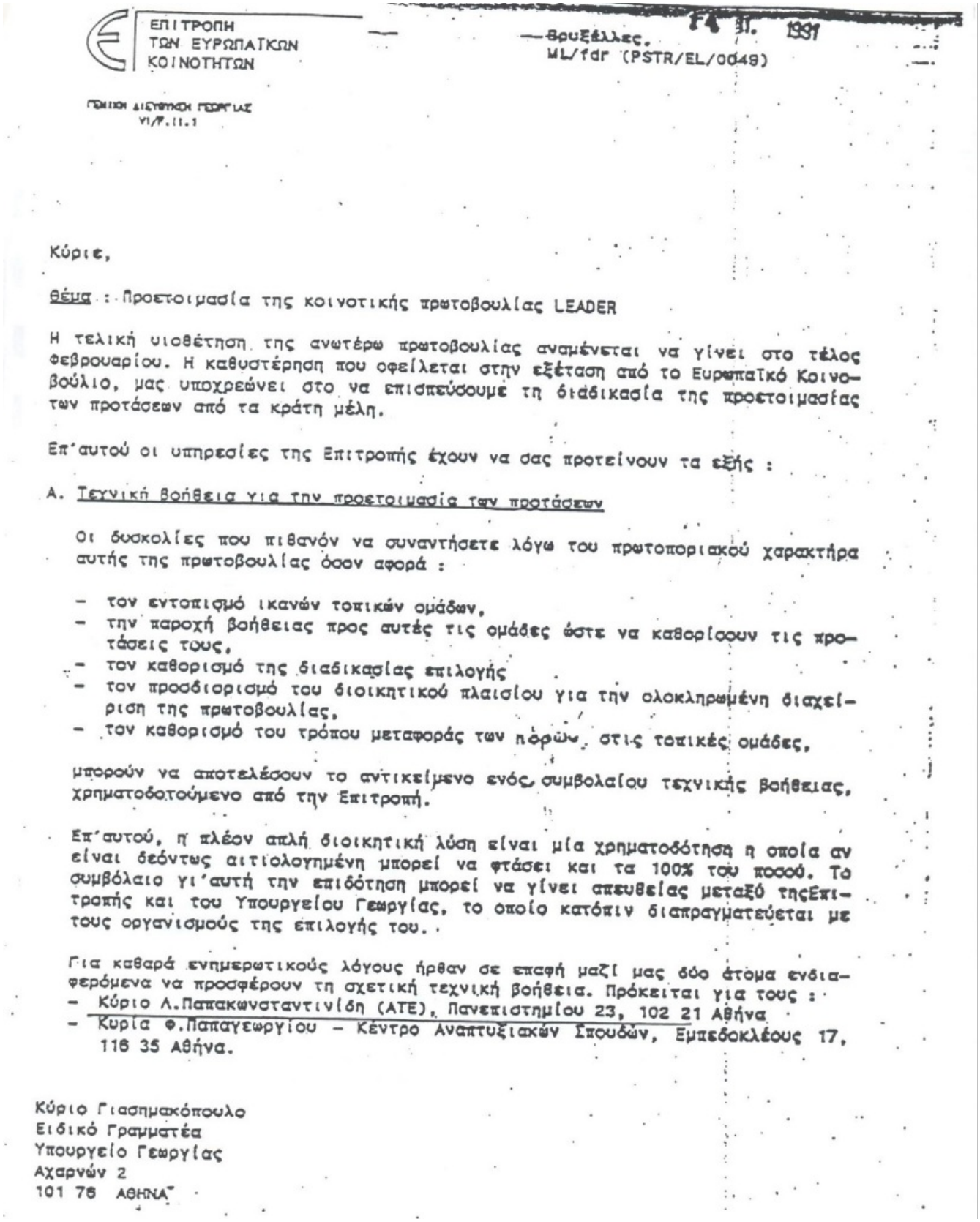
Because the value of the control statistic is NOT in the rejection region, the null hypothesis at the 0.05 significance level is accepted The probability that this conclusion is false is at most 0.05

Negotiation is an end in itself	**1.58**	**< 15507**	**H_1**
Negotiation is cooperation	**26.49**	**> 15507**	**H_0**
Negotiation is a function	**30.25**	**> 15507**	**H_0**

This means that in questions 1.2 and 1.3the null hypothesis, at a significance level of 0.05 is accepted Since the null hypothesis is true, it is shown that the random variable , for large n follows a χ^2 distribution with k -1 degrees of freedom, that is, for large n, approximately we have that the control function quantifies (in a certain way) the deviations (differences) between observed and expected frequencies. We thus give an answer to a goodness - of - fit test tests). That is, goodness-of-fit tests allow us to test whether a probability distribution fits/fits the sample of 1345 respondents (chi - square goodness - of - fit test)

Appendix

Certificate of LEADER EU Initiative



ΕΠΙΤΡΟΠΗ
ΤΩΝ ΕΥΡΩΠΑΪΚΩΝ
ΚΟΙΝΟΤΗΤΩΝ

ΓΕΝΙΚΗ ΔΙΕΥΘΥΝΣΗ ΓΕΩΡΓΙΑΣ
VI/F.II.1

Βρυξέλλες, 14 31. 1991
ML/fdr (PSTR/EL/0049)

Κύριε,

Θέμα : Προετοιμασία της κοινοτικής πρωτοβουλίας LEADER

Η τελική υιοθέτηση της ανωτέρω πρωτοβουλίας αναμένεται να γίνει στο τέλος Φεβρουαρίου. Η καθυστέρηση που οφείλεται στην εξέταση από το Ευρωπαϊκό Κοινοβούλιο, μας υποχρεώνει στο να επισπεύσουμε τη διαδικασία της προετοιμασίας των προτάσεων από τα κράτη μέλη.

Επ'αυτού οι υπηρεσίες της Επιτροπής έχουν να σας προτείνουν τα εξής :

A. Τεχνική βοήθεια για την προετοιμασία των προτάσεων

Οι δυσκολίες που πιθανόν να συναντήσετε λόγω του πρωτοποριακού χαρακτήρα αυτής της πρωτοβουλίας όσον αφορά :

- τον εντοπισμό ικανών τοπικών ομάδων,
- την παροχή βοήθειας προς αυτές τις ομάδες ώστε να καθορίσουν τις προτάσεις τους,
- τον καθορισμό της διαδικασίας επιλογής
- τον προσδιορισμό του διοικητικού πλαισίου για την ολοκληρωμένη διαχείριση της πρωτοβουλίας,
- τον καθορισμό του τρόπου μεταφοράς των πόρων στις τοπικές ομάδες,

μπορούν να αποτελέσουν το αντικείμενο ενός συμβολαίου τεχνικής βοήθειας, χρηματοδοτούμενο από την Επιτροπή.

Επ'αυτού, η πλέον απλή διοικητική λύση είναι μία χρηματοδότηση η οποία αν είναι δεόντως αιτιολογημένη μπορεί να φτάσει και τα 100% του ποσού. Το συμβόλαιο γι'αυτή την επιδότηση μπορεί να γίνει απευθείας μεταξύ τηςΕπιτροπής και του Υπουργείου Γεωργίας, το οποίο κατόπιν διαπραγματεύεται με τους οργανισμούς της επιλογής του.

Για καθαρά ενημερωτικούς λόγους ήρθαν σε επαφή μαζί μας δύο άτομα ενδιαφερόμενα να προσφέρουν τη σχετική τεχνική βοήθεια. Πρόκειται για τους :
- Κύριο Λ.Παπακωνσταντινίδη (ΑΤΕ), Πανεπιστημίου 23, 102 21 Αθήνα
- Κυρία Φ.Παπαγεωργίου - Κέντρο Αναπτυξιακών Σπουδών, Εμπεδοκλέους 17, 116 35 Αθήνα.

Κύριο Γιασημακόπουλο
Ειδικό Γραμματέα
Υπουργείο Γεωργίας
Αχαρνών 2
101 76 ΑΘΗΝΑ

Footnotes

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