

On the crowding-out effect of Intrinsic Motivations in the Field of Prevention: When Economic Incentives Need Well-being at Work to Be Effective

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Abstract : This work intends to check, from an empirical perspective, if economic incentives can have a detrimental effect on GPs' intrinsic motivations, which is called "crowding-out effect of intrinsic motivations" since the seminal work of Frey (1993), in the particular field of health prevention services. We use a "randomized experiment" on a panel of 1875 GPs practicing in five regions of France to identify the impact of different amounts and types of economic incentives on their intentions to carry out two different types of tasks in prevention field (doing a prevention check-up during a given consultation, attending a vocational training on therapeutic patient education). Our sample was randomly divided into three equal groups of GPs who were submitted to different scenarios of payment schemes encouraging them to realize these tasks. Our results does not highlight a crowding-out effect of economic incentives on GPs' intrinsic motivations in prevention field. However, we show that the effectiveness of incentives is conditioned by the type of task rewarded and by GPs' work-related well-being, estimated through a psychosociological indicator of work engagement.

Résumé : Ce travail se donne pour objectif de vérifier empiriquement si les incitations économiques peuvent avoir un effet contreproductif sur les motivations intrinsèques des médecins généralistes, que l'on qualifie généralement d'effet d'éviction des motivations intrinsèques depuis l'article fondateur de Frey (1993), dans le domaine de la prévention. A partir d'un panel de 1875 médecins généralistes exerçant dans 5 régions de France, nous utilisons un dispositif « expérimental » randomisé afin d'identifier l'impact de différents niveaux et types d'incitations économiques sur l'intention qu'ont ces médecins d'effectuer deux tâches différentes dans le domaine de la prévention (consacrer du temps additionnel à faire de la prévention dans le cadre d'une consultation donnée, participer à une journée de formation dans le domaine de l'éducation thérapeutique du patient). Notre échantillon de médecins généralistes a été divisé aléatoirement en trois groupes de taille équivalente, chacun ayant été soumis à différents scénarii de paiements censés les inciter à réaliser les tâches en question. Nos résultats ne plaident pas pour l'existence d'un effet d'éviction des motivations intrinsèques par les incitations économiques dans le domaine de la prévention. En revanche, ils montrent que l'efficacité des incitations économiques est conditionnée par le type de tâches récompensées et par le sentiment de bien-être au travail des individus que nous appréhendons grâce à un indicateur psychosociologique d'engagement au travail.

Keywords: Crowding effects, intrinsic motivations, work engagement, randomized experiment

JEL Codes: A12, J33, C93, I18

The French health system, notably in its primary care component, is widely considered to be “cure-centred” which is detrimental to the provision of preventive services. In general practice, the fact that fee-for-service (FFS) is the dominant payment scheme can contribute to explain this deficit of prevention because the opportunity cost of carrying out preventive tasks is larger than in capitation payment scheme for instance. Even if prevention supply cannot be fully assumed by self-employed General Practitioners (GPs), most of the proposals dedicated to improve the situation directly concerned the latter: shifting preventive task from GPs to nurses, creation of a better-paid extended consultation dedicated to prevention... The generalization of pay-for-performance (P4P) for self-employed GPs in France since the 1st of January 2012, with the so-called “Payment for Public Health Objectives” (ROSP or “*Rémunération sur Objectifs de Santé Publique* in French) can be seen as the latest answer of the National Health Insurance Fund to this issue, as it offers payments for GPs reaching some target indicators in the field of prevention (influenza vaccination coverage in elderly people and in patients suffering from chronic diseases, breast cancer screening and cervix cancer screening respectively for 50-74 years-old women and 25-65 years-old women...). In this context, determining whether the use of economic incentives to urge self-employed GPs to spend more time in prevention activities is likely to be effective or, on the contrary, could turn into a crowding-out effect (COE) of intrinsic motivations to provide preventive services, seems of interest. It is the main objective of this work.

Intrinsic motivations correspond to the fact that people realize a task because of the direct and inherent satisfaction that they experience when doing it, beyond any desire of being rewarded for it. On the contrary, extrinsic motivations imply that people realize a task because they expect an exogenous reward such as economic incentives like payment.

As the likelihood of a COE of extrinsic motivations on intrinsic ones is particularly significant in medical field (see the IGAS report of Bras and Duhamel (2008)), we want to test whether self-employed GPs could be directly concerned by this phenomenon in the context of health promotion activities that we regard as being particularly relevant because intrinsic motivations should be more requested, especially when physicians are paid with FFS as we mentioned earlier¹.

¹ We meet Woodward and Warren-Boulton’s point of view, in their article of 1984 according to which the professional ethics of physicians, that we regard as one constituent of intrinsic motivations, could compensate for the side effect of FFS system which generally incite physicians to over-supply health care compared to the level which maximizes patients’ interest.

In France, the use of economic incentives has become one of the favoured instruments to regulate the primary care system where GPs play the role of gatekeeper and reached its peak with the implementation of the ROSP/P4P program above-cited.

P4P program often has the twofold objective of improving efficiency in delivery of care and health care quality. Yet, the existing literature analyzing the impact of P4P programs presents some limits when precisely answering the question whether P4P allow to improve health care quality (for a detailed review, see for instance Christianson, Leatherman et Sutherland, 2007 ; Bras et Duhamel, 2008; Ammy et Béjean, 2008). First of all, this literature gives little information concerning the impact of P4P on healthcare quality (Scott et Hall, 1995 ; Kingma, 1999). Then, most of the studies which focused on the impact of economic incentives on healthcare quality in the field of prevention found a small positive effect (Achat, McIntyre et Burgess, 1999 ; Dudley *et al.*, 2004 ; Kouides *et al.*, 1998), or a non significant effect (Grady *et al.*, 1997 ; Conrad et Christianson, 2004 ; Town *et al.*, 2005 ; Petersen *et al.*, 2006 ; Rosenthal et Frank, 2006 ; Hillman *et al.*, 1998, 1999). And finally, few studies evaluating the effectiveness of P4P programs seem rigorously conducted (Petersen *et al.*, 2006). In general, this kind of studies fails to tackle the sample selection bias problem due to observable or unobservable individual characteristics which affect the causality between P4P programs and physicians' performance. Notably, physicians participating to these programs are likely to be the most motivated and performing ones (they get a financial compensation for their performance that remained unrewarded so far).

We try to control for this bias in order to identify the real impact of P4P programs on GPs behaviour regarding health promotion, by using a “pseudo randomized field experiment” which consists in confronting randomly selected physicians to different hypothetical scenarios of economic incentives to perform preventive tasks (no payment *vs.* P4P of different amounts).

To check the possible existence of a COE of economic incentives on physicians' delivery of preventive services, we adopt an empirical approach where GPs were asked through a questionnaire how they would behave facing with different scenarii of economic incentives (no incentives, small incentives, high incentives). We want to control if the share of physicians which self-report that they would realize some activities improving prevention services supply to patients change depending on the type and amount of economic incentives. To empirically measure intrinsic motivations as robustly as possible, we decide to use the psycho-sociological concept of work engagement which is captured through an internationally

validated scale and enables to build an individual score of engagement at work. We regard our methodology as fitting into both experimental economics and behavioral economics. Indeed, we attempt to study how individual's decision process is affected by economic incentives when intrinsic motivations are at play. Moreover, even if our method is neither a laboratory experiment (because we do not study *in vitro* behaviours in a lab context where parameters are fully controlled in order to reason all things being equal) nor a field experiment (because we do not observe an intervention in a real world), it can be labeled as an experimental one because we randomly select from our initial sample three groups of GPs of equal size (thus we do have treatment and control groups) who were confronted to different hypothetical scenarios where we control our variable of interest (economic incentives). Obviously, we test how intentions are modified when introducing different scenarios of payment. To our knowledge, evaluating the impact of P4P programs on GPs performance in terms of prevention using this kind of methodology has not been realized yet in France and there are only a few studies elsewhere². One of the advantages of this work is that our experimental procedure applies to a specific professional status, that of GPs, whereas most experimental studies use sample of students or lambda citizens.

The remainder of the article is organized as follows. Firstly, we present the methodology that we used (section 1). Afterwards, we describe our data (section 2). Then, we comment on our results (section 3) that are finally discussed (section 4). Section 5 concludes.

1- Methodology

In order to carry out this work, we rely on Frey and Oberholzer-Gee's (1997) study which empirically found evidence of a detrimental effect of economic incentives on people's intrinsic motivations to accept the location of a nuclear waste repository near their home. They distinguished between two kinds of radioactive waste (short-lived, low- and midlevel radioactive vs long-lived, highly radioactive) to introduce different levels of effort.

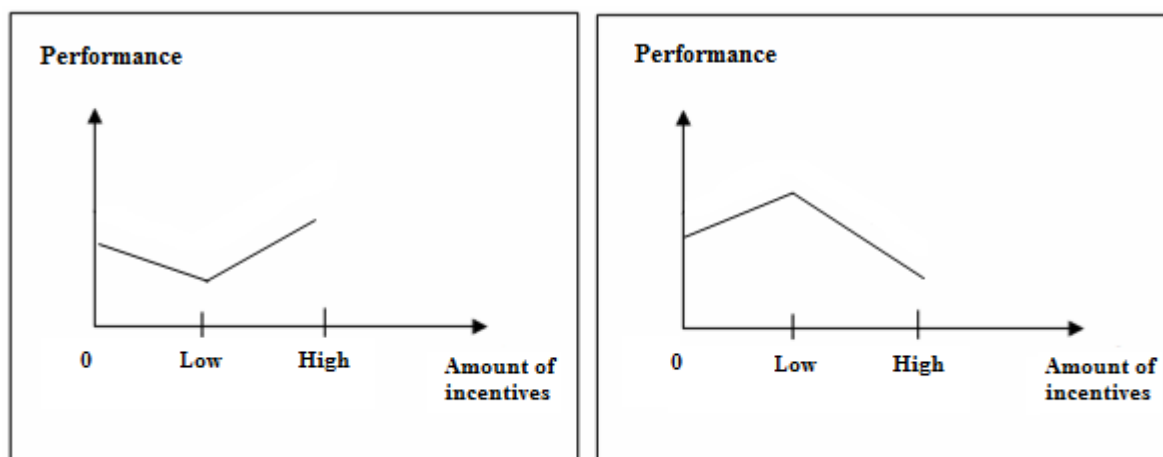
² The only works which attempted to highlight the existence of a COE of economic incentives on intrinsic motivations in medical field (Gené-Badia *et al.*, 2007 ; McDonald *et al.*, 2007 ; Leonard et Masatu, 2010) rely on physicians in Spain, United Kingdom and Tanzania. The first two studies did not use "experimental" device as rigorous as ours but the third one did. However, these three studies are limited by the quite small size of their sample.

In our study, we try to replicate their enquiry framework, adjusting it to our issue, to see whether economic incentives is a good instrument to improve prevention practices in primary care. More precisely, we want to analyze the impact of introducing monetary incentives, considering two kinds of incentives (flat payment or increase in FFS payment), compared to the case with no incentives at all, on GPS' intention to carry out two activities in the field of health promotion: provide preventive services to patients during a given consultation, attending to a vocational training on therapeutic patient education (TPE). These both activities have in common to imply a costly effort (in terms of opportunity cost) and to involve intrinsic motivations. However, they are different depending on the nature of the effort: on one hand, the effort is made during the consultation (consultation initiated by patients) and is directly dedicated to patients; on the other hand, the effort is made without any interaction with patients (only relying on physicians' commitment) and dedicated to the improvement of physicians' practice (thus indirectly impacting patient well-being).

For the first type of activities, we think that introducing monetary incentives can be harmful to the feeling of autonomy and self-determination of physicians whereas for the second type it would be physicians' feeling of competence (*i.e.* perceiving oneself to be competent and being perceived as well by the National health insurance fund) which could be damaged. According to the Cognitive Evaluation Theory of Deci and Ryan (1980, 1985), these both configurations are likely to generate a COE of intrinsic motivations. Yet, it is also possible that introducing monetary incentives is considered by physicians as a fair reward of their efforts (*i.e.* more in conformity with their expectations than what they usually get paid) which could translate into a crowding-in effect according to which intrinsic motivations and monetary incentives are complementary.

Concerning the choice of the amount of monetary incentives, we want to test the existing assumption in the literature about COE according to which the impact of monetary incentives on people's performance is non monotonic and/or non linear, and even characterized by a discontinuity (Gneezy et Rustichini, 2000 ; James, 2005 ; Ariely *et al.*, 2009). According to this literature, two results are possible: either a low amount of monetary incentives generates a COE and a sufficient amount of incentives generates a crowding-in effect, or a low amount of incentives has a positive effect on people's performance and it is the high amount of incentives which generates a COE (see figure 1).

Figure 1 : Two different cases where a COE of intrinsic motivations can occur



As a consequence, we defined three different scenarios : scenario 1 within which both activities have to be carried out without monetary incentives of any kind, scenario 2 within which the amount of incentives is likely to be perceived as quite low by physicians, and scenario 3 within which a high level of incentives is proposed to physicians. The underlying idea is the following: defining a good scope for policies using incentives is a key determinant of its success.

Finally, we also test whether different types of incentives - a lump-sum payment in the first case and a fee increase (in a FFS system where physician's income depends on the level of activity) in the second case - generate different impacts on physicians' performance.

II- Data

This work relies on the exploitation of a panel of 1875 French self-employed GPs practicing in five administrative regions (Lower Normandy, Burgundy, Brittany, Pays de la Loire and PACA) which differ according to medical density and sociodemographic characteristics of patients. The main objective of this panel consists in observing GPs' practices, workload and professional environment in order to identify their main determinants. In this panel, physicians with a particular type of practices such as acupuncture, homeopathy, allergology... (called *médecins à Mode d'Exercice Particulier* or MEP in French) are excluded because their practice is not representative of that of GPs'. In this work, we do not take advantage of the panel dimension of data because we mainly use the fifth wave of the panel (cross sectional data analysis). Contrary to Frey and Oberholzer-Gee's (1997) studies whose data were collected through face-to-face interviews, GPs of our panel were enquired by phone through

the Computer Assisted Telephone Interviewing (CATI) system. Declaration biases seem more likely to occur because this enquiry method is more impersonal and maybe less involving. We split our sample into three groups of comparable size ($n_1=630$, $n_2=622$, $n_3=623$), each of them being asked two series of questions whose wording were different from one group to the other in order to obtain the three scenarios of incentives above-mentioned.

Concretely, we asked to each group two different questions:

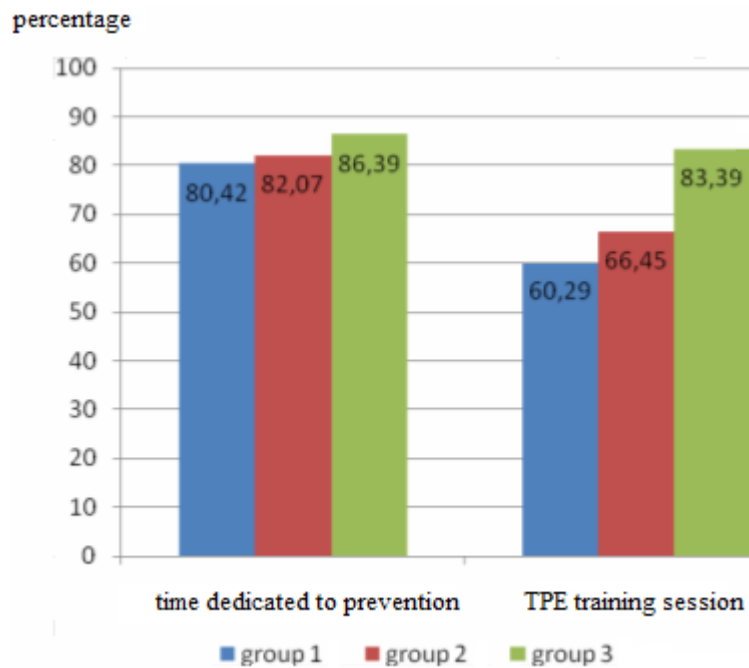
- For group 1, “During a consultation with one of your patients, would you be willing to spend extra time to prevention activities?” and “Would you be willing to attend a one-day training session in the field of therapeutic patient education (TPE)?”
- For group 2, “During a consultation with one of your patients, would you be willing to spend extra time to prevention activities, if consultation fee would increase by 11€?” and “Would you be willing to attend a one-day training session in the field of therapeutic patient education (TPE) if you are offered a compensation of 176€ (8 consultations of 22€)?”
- For group 3, “During a consultation with one of your patients, would you be willing to spend extra time to prevention activities, if consultation fee would treble (66€)?” and “Would you be willing to attend a one-day training session in the field of therapeutic patient education (TPE) if you are offered a compensation of 500€?”

III- Results

III.1- Gross results on the whole GPs population

Our results do not confirm the existence of a COE of intrinsic motivations by monetary incentives, whereas we believed the field of prevention particularly conducive to the expression of intrinsic motivations. On the contrary, as standard theory predicts, monetary rewards increase GPs’ reported intentions to carry out both considered activities - more time dedicated to prevention tasks or attending a training session in TPE (see figure 2). However, the size of the positive effect differs depending on the type of activity and the associated payment system.

Figure 2 : GPs' reported willingness according to the different scenarios of incentives



We can notice that a small increase of the consultation fee (by 11€) is not enough to incite GPs to devote more time in preventive activities for a given consultation (the difference is not statistically significant, see appendix 1), compared to the no incentives scenario, whereas it is the case with a strong increase of the consultation fee (by 66€).

Concerning the participation to the one-day training session in the field of TPE, 60.3% of GPs report to be favourable in the case where no compensation is offered, whereas they are 66.5% when they are compensated by a lump-sum payment of 176€ and 83.4% with a lump-sum payment of 500€. These differences are statistically significant (see appendix 1).

The lump-sum payment seems to be a quite effective incentive because the share of GPs reporting their intention to attend a training session increases with the amount of compensation. Again, the crowding-in effect assumption seems to be the right one, even if the scope of this effect depends on the size of the incentive.

If we compare the shares between both activities, we notice that the intention of GPs to spend more time delivering preventive services in a given consultation is always superior to the intention to attend a training session in TPE, whatever the level of monetary incentives. This could be explained by the different nature of the effort implied in each of these activities (spending some more minutes with patients during consultations at the office *vs.* spending an

entire day outside the office). However, we can notice that a sufficiently high amount of monetary incentives allows to rebalance the share of GPs ready to carry out both activities.

III.2- Extension of the results : a sample stratification depending on the level of intrinsic motivations

These first results, obtained without distinguishing between GPs' level of intrinsic motivations, do not confirm the existence of a detrimental effect of monetary incentives on GPs' intention to carry out actions in the field of health promotion. Yet, the literature in Psychosociology insists on the fact that measuring people's intrinsic motivations through the direct observation of their performance when they carry out some tasks is likely to be misleading. Indeed, the risk is to make confusion between a change in behaviour and the motives of this change (Fehr and Falk, 2002)³. To overcome this problem, we chose to analyze the self-reported intentions of GPs to perform some preventive activities by distinguishing according to their level of intrinsic motivations. We thus stratified our sample on the basis of GPs' level of intrinsic motivations to control whether the impact of monetary incentives on GP's performance is different for intrinsically motivated GPs or not. GPs' intrinsic motivations at work are captured through the concept of "work engagement", taken from psychology, which is more operational because it can be measured through an internationally validated psychometric scale. Furthermore, using "work engagement" as a proxy for intrinsic motivations is quite faithful to the spirit of this concept initially developed by Deci (1971), enables to take advantage of psychosociologists' know-how in terms of psychometric scale and avoids uncertain interdisciplinary transfer of concept.

Firstly, we describe the construction of our "work engagement" indicator and then we present the results when stratifying by this variable.

III.2.1- The construction of our "work engagement" indicator

³ "The problem with this interpretation is that it confuses behaviour with motives. If, whenever people change an activity, we claim that this happens because their intrinsic motivation for this activity has somehow changed, our explanations become empty." (Fehr et Falk, 2002: p. 719).

The concept of “work engagement” is a more recent one than intrinsic motivations in psychosociology⁴. It is a multidimensional concept reflecting people’s well-being at work, which is opposed to burn-out concept (Schaufeli *et al.*, 2002 ; Schaufeli et Bakker, 2003, 2010 ; Schaufeli, Taris et Van Rhenen, 2008), and consequently has to be assessed with its own indicators, principally the “*Utrecht Work Engagement Scale*” (UWES) of Schaufeli *et al.* (2002), Schaufeli and Bakker (2003), which is composed of several items (9 for the UWES 9, 15 for the UWES15 and 17 for the UWES17) capturing the three dimensions of work engagement: “vigor” *i.e.* the willingness to make important efforts in order to overpass difficulties, “dedication” *i.e.* being strongly involved in one’s work and “absorption” *i.e.* enthusiasm into one's work in a such a way that one can experience difficulties with detaching from work.

To empirically estimate GPs’ work engagement, we use the fourth wave of our panel dedicated to self-employed GPs’ working conditions and the consequences on their own health and the quality of care which included questions of the UWES with 15 items from which we remove the five questions capturing the “absorption” dimension of work engagement. Indeed, the main dimensions of work engagement are “vigor” and “dedication” (Schaufeli *et al.*, 2002 ; Schaufeli et Bakker, 2003). We only kept 10 items whose response scale was the following 7-point Likert scale (0- Not-at-all or very little, 1- A little, 2- Enough, 3- Moderately, 4- Much, 5- Very much, 6- Enormously):

1. *I am proud of the work that I do*
2. *To me my job is challenging*
3. *At my work, I feel bursting with energy*
4. *I am enthusiastic about my job*
5. *At my work I always persevere, even if when things do not go well*
6. *At my job, I feel strong and vigorous*
7. *My job inspires me*
8. *I find the work that I do full of meaning and purpose*
9. *At my job, I am very resilient mentally*
10. *When I get up in the morning, I feel like going to work*

⁴ For a review of the emergence of work engagement concept, see Bakker *et al.* (2008).

We controlled that both of these dimensions were present here in order to build a score of work engagement with the minimum number of items and the maximum internal consistency (Schaufeli *et al.*, 2002). We thus made a Principal Component Analysis (PCA), after controlling its relevance with the traditional tests (collinearity test, Bartlett's test of sphericity, KMO index, and checked the reliability of the score using Cronbach's alpha method).

The PCA showed that all items could be assembled in one unique dimension⁵ and the Cronbach's alpha statistic confirmed the internal consistency of our score of work engagement but we only kept 7 items because they were associated to the maximum value of Cronbach's alpha (0,85). Then, we compute the "work engagement" score for each GPs by using both the vector of weights associated to each item (noted λ), where each weight is the share of the total common variance explained by each item for the unique component that we considered, and the matrix of correlation coefficients (noted R). Finally, we used a linear regression in order to adjust the loadings we obtained by taking into account the initial correlation between the different items.

The work engagement score, for each GP i , is estimated as follows:

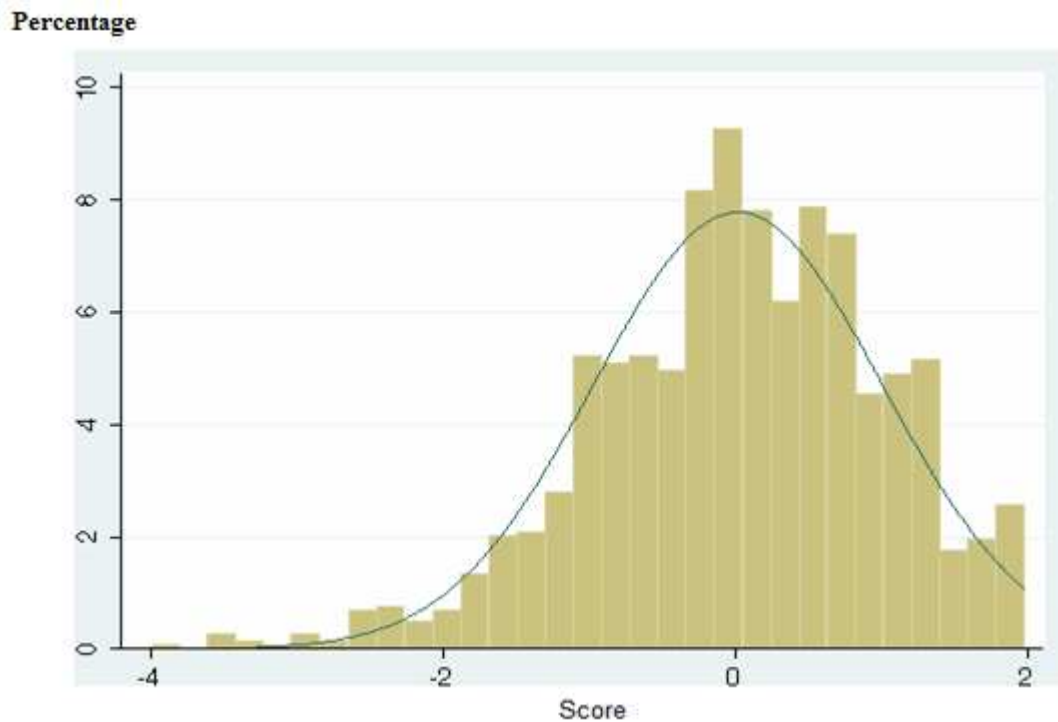
$$\text{SCORE}_i = \beta_1 * \text{item}_{1i} + \beta_2 * \text{item}_{2i} + \beta_3 * \text{item}_{3i} + \dots + \beta_k * \text{item}_{ki}$$

where the β_k are the estimated weights computed by multiplying the λ vector by the reverse of the matrix of correlation coefficients R^{-1} (see for instance, Mardia, Kent and Bibby (1979), Field (2005)).

We finally got a normalized score (for 1437 GPs), with a zero mean, whose graphical representation is given in figure 3.

⁵ Unlike Schaufeli et Bakker (2003), who showed that a certain number of factorial analyses confirmed the superiority of models of work engagement distinguishing three dimensions relatively to models gathering all the items in only one dimension, our study highlights that modeling work engagement score by considering only one dimension seems more appropriate, as did previously Sonnentag (2003). "*Work engagement, as assessed by the UWES may be considered a one-dimensional as well as a three-dimensional construct. The high correlations between the three dimensions (see Table 22) and the high values for Cronbach's alpha for the total scale (see Table 17) support a one-dimensional model, whereas the superior fit of the three dimensional model supports the three-dimensional model (at least for the UWES-15 and UWES-17)*" (Schaufeli et Bakker, 2003: p. 30).

Figure n°3 : Work engagement score histogram

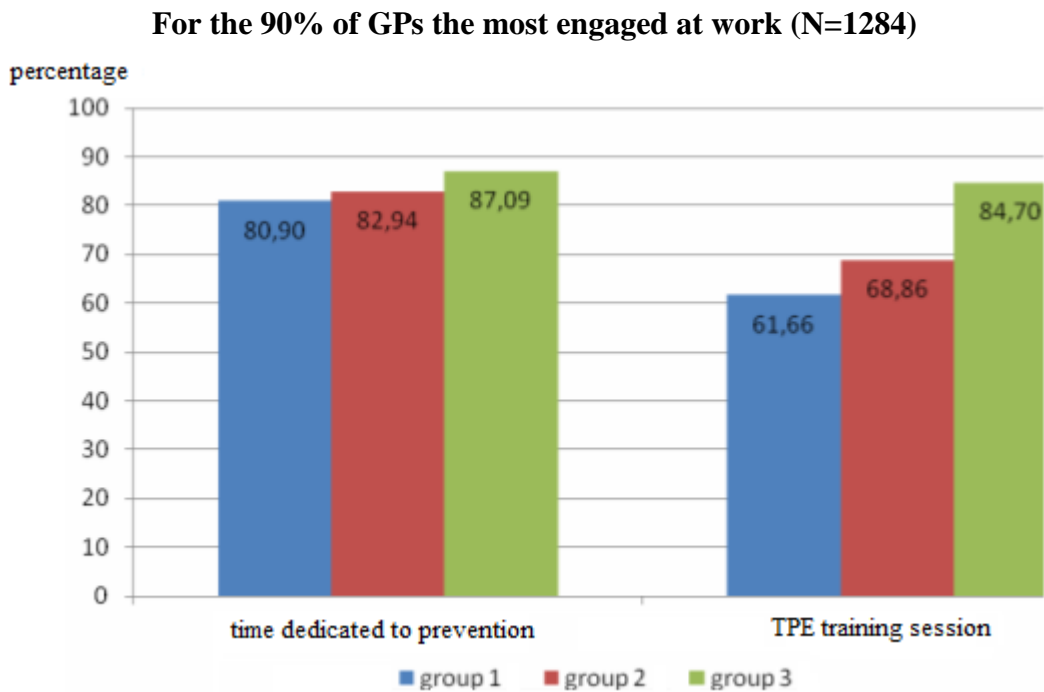
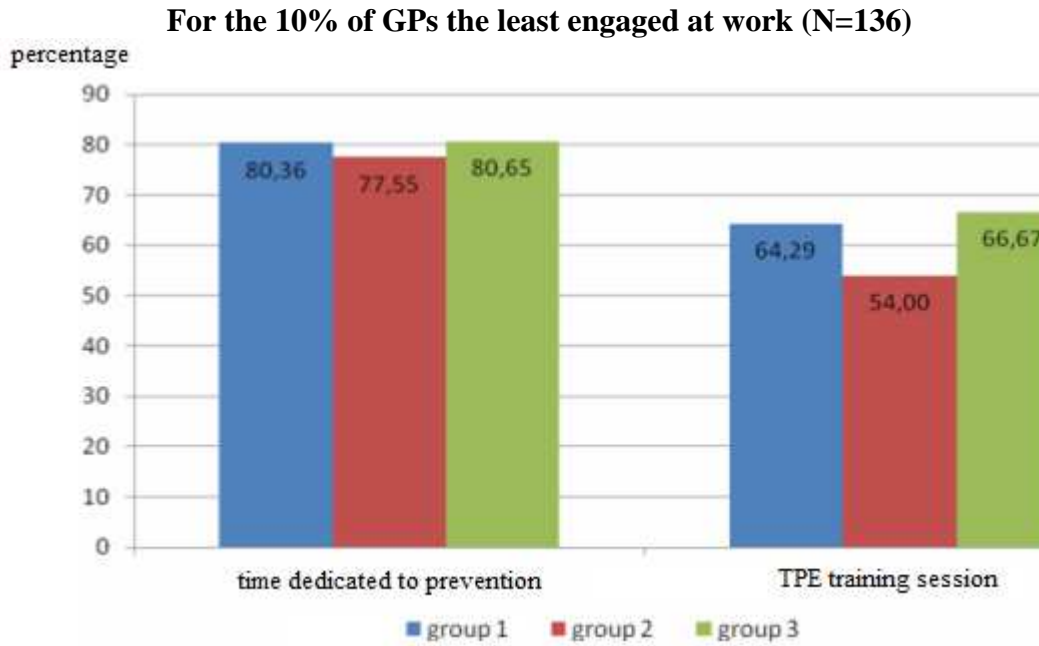


Grid of reading : a negative score means that the individual has a level of work engagement inferior to the sample mean and conversely.

III.2.3- The asymmetric impact of monetary incentives depending on the level of intrinsic motivations

We try to determine whether the level of intrinsic motivations (proxied by work engagement) alter the impact of monetary incentives on GPs performance in the field on health promotion. In our study, we decided to focus on less work engaged GPs which we assume to be less responsive to monetary incentives. We thus split our sample at the first decile to compare the 10% of GPs the least engaged at work to the others. Results are presented in figure 4. We proceeded to a sensitivity analysis to check the robustness of our results to other split of the sample (see appendix 2): our results seem quite robust even if the more we focus on less work engaged GPs, the more our results are confirmed.

Figure 4 : Impact of monetary incentives on GPs intentions to carry out specific activities depending on their level of work engagement



For both activities, we notice obvious differences in terms of behaviour between the two categories of GPs. The GPs who are less engaged at work are those for whom monetary incentives have the weakest impact on their intentions to carry out the considered activity, even when the level of incentives is high and whatever the type of activity (devoting time to prevention or attending a training session in TPE).

Moreover, we can see that, for this category of GPs (those less engaged at work), introducing small monetary incentives would decrease the share of GPs ready to carry out both of the considered activities, compared to the situation where no monetary incentives are offered. This result is identical to that of Frey and Oberholzer-Gee (1997) : monetary incentives can sometimes have a detrimental effect on people’s willingness to make pro-social efforts (COE). Nevertheless, the observed gap between the “no incentives” scenario and the “small incentives” scenario is not statistically significant for both kind of activities (see appendix 3). On the contrary, we clearly highlight a crowding-in effect of monetary incentives for GPs the more work engaged, particularly for the training session in TPE.

To confirm this graphical intuition according to which the level of work engagement affects GPs’ responsiveness to monetary incentives, we regress (logistic regression) respectively the independent variables “to be ready to devote more time to prevention actions” and “to be ready to attend a training session in TPE” on the following dependent variables: scenarios of payment, work engagement score (see table 1). We control for gender, age and GPs’ practice location (urban vs. rural).

Table 1 : Impact of incentives and work engagement on GPs reported behaviour depending on the kind of activities

For the activity of prevention

Prevention N=1391	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
Man	.2004013	.1786042	1.12	0.262	-.1496566 .5504592
Age	-.00921	.0099045	-0.93	0.352	-.0286226 .0102025
Rural Practice	-.0537066	.1694774	-0.32	0.751	-.3858762 .2784629
Scenario 2	.0999822	.1622974	0.62	0.538	-.2181149 .4180794
Scenario 3	.3784741	.1880534	2.01	0.044	.0098962 .747052
Engagement	-.2264435	.2258462	-1.00	0.316	-.6690939 .2162069
Intercept	1.907238	.5385178	3.54	0.000	.8517622 2.962713

For the activity of training session in TPE

Training TPE N=1398	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
Man	.2122783	.148242	1.43	0.152	-.0782707 .5028272
Age	-.030808	.0084456	-3.65	0.000	-.0473611 -.0142549
Rural Practice	.0423167	.1434083	0.30	0.768	-.2387584 .3233917
Scenario 2	.2457493	.1324954	1.85	0.064	-.0139368 .5054355
Scenario 3	1.118843	.167198	6.69	0.000	.7911412 1.446545
Engagement	-.3795451	.191052	-1.99	0.047	-.7540002 -.00509
Intercept	2.06167	.4587302	4.49	0.000	1.162575 2.960765

The reported share of GPs ready to carry out both of each considered activities increase in a statistically significant way (at 5% threshold) only for a high amount of monetary incentives. The level of work engagement is statistically significant only for the activity of training session in TPE and the coefficient sign is quite counterintuitive. We thus decided to include as explaining variables into the regression some interaction variables between the level of work engagement and the level of monetary incentives (see table 2).

Table 2 : Impact of incentives and work engagement on GPs reported behaviour depending on the kind of activities (with interaction variables)

For the activity of prevention

Prevention N=1391	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Scenario 2	.1341622	.1723862	0.78	0.436	-.2037086	.472033
Scenario 3	.4189252	.1994016	2.10	0.036	.0281052	.8097452
Engagement	-.0402947	.3581427	-0.11	0.910	-.7422415	.6616521
Interac eng/sc2	-.2935338	.5109946	-0.57	0.566	-1.295065	.7079972
Interac eng/sc3	-.3620951	.6015232	-0.60	0.547	-1.541059	.8168686
Man	.1928917	.1790491	1.08	0.281	-.1580381	.5438215
Age	-.0093438	.0099127	-0.94	0.346	-.0287723	.0100848
Rural Practice	-.0569029	.1695592	-0.34	0.737	-.3892329	.2754271
Intercept	1.894321	.539089	3.51	0.000	.8377256	2.950916

For the activity of training session in TPE

Training TPE N=1398	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Scenario 2	.3294362	.1404619	2.35	0.019	.0541359	.6047366
Scenario 3	1.243811	.1793163	6.94	0.000	.8923575	1.595264
Engagement	.1168639	.2981046	0.39	0.695	-.4674105	.7011383
Interac eng/sc2	-.7479192	.4253095	-1.76	0.079	-1.581511	.0856721
Interac eng/sc3	-1.089585	.5140877	-2.12	0.034	-2.097179	-.081992
Man	.1915259	.1487988	1.29	0.198	-.1001144	.4831661
Age	-.0312518	.0084663	-3.69	0.000	-.0478454	-.0146582
Rural Practice	.0343699	.1436463	0.24	0.811	-.2471717	.3159114
Intercept	2.0348	.4596412	4.43	0.000	1.133919	2.93568

Results show that the interaction variables are statistically significant for scenario 2 (p=0,079) and scenario 3 (p=0,034) only for the participation to the training session in TPE. GPs the more engaged at work are more likely to attend a training session in TPE when they are offered monetary incentives, whether small or high⁶.

Finally, we tested whether the coefficients linking the variable “ready to participate to a

⁶ The negative coefficient sign for the interaction variables between work engagement and incentives scenario is explained by the fact that the reference for the « work engagement » variable is a low level of work engagement.

training session in TPE” to our both “incentives scenario” variables were statistically significantly different from one sample to the other (less work engaged vs. more engaged) by using the likelihood ratio test. Results are shown in table 3.

Table 3 : Impact of monetary incentives on GPs reported behaviour depending on the level of work engagement

Pour l’activité de formation à l’ETP

10% less engaged N=136	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Man	.8034419	.4979053	1.61	0.107	-.1724345	1.779318
Age	.0023633	.0272527	0.09	0.931	-.051051	.0557776
Rural Practice	-.2315293	.4204454	-0.55	0.582	-1.055587	.5925284
Scenario 2	<u>-.3918145</u>	.4061869	-0.96	<u>0.335</u>	-1.187926	.4042972
Scenario 3	<u>.2498514</u>	.4897466	0.51	<u>0.610</u>	-.7100343	1.209737
Intercept	.3076206	1.491549	0.21	0.837	-2.615761	3.231002

90% more engaged N=1262	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Man	.1323824	.1561318	0.85	0.396	-.1736302	.438395
Age	-.0344657	.0089553	-3.85	0.000	-.0520177	-.0169136
Rural Practice	.0669372	.1533665	0.44	0.663	-.2336556	.36753
Scenario 2	<u>.3318433</u>	.1405819	2.36	<u>0.018</u>	.0563078	.6073789
Scenario 3	<u>1.24668</u>	.1794396	6.95	<u>0.000</u>	.8949845	1.598375
Intercept	2.207674	.4852307	4.55	0.000	1.256639	3.158709

Contrary to the more work engaged GPs who are very responsive to the introduction of monetary incentives, the less work engaged GPs seem to be relatively inelastic to monetary incentives, whatever their amount. The likelihood ratio test confirms the difference in the coefficients between both sample is statistically significant with a p-value of 0.0609.

IV- Discussion

Although our work is close to that of Frey and Oberholzer-Gee (1997) because they both study how human behaviour influenced by “social norms” (respecting one’s citizen’s duty or respecting professional ethics) are affected by the introduction of monetary incentives, results are different. Our specific experimental design does not corroborate the existence of a COE of intrinsic motivations by extrinsic rewards but, on the contrary, highlights a crowding-in effect whatever the considered type of activity in the field of health promotion (devoting more time to preventive actions during a consultation or attending to a training session in TPE). Our first

main result is that an increasing level of extrinsic rewards improves individual's pro-social behaviour.

Yet, the impact of monetary incentives differs according to the type of activity and its associated payment scheme. Increasing the consultation fee in the framework of FFS system (which contributes to the reduction of the opportunity cost of prevention supply) does not prove effective, whatever the offered level of compensation whereas increasing GPs income through a lump-sum payment enables to change GPs reported behaviour. These results are at odds of the results of Dudley *et al.* (2004) who demonstrated that the effectiveness of P4P on healthcare quality was stronger when it took the form of an increase in FFS payment and not a lump-sum bonus.

Two interpretations of the relative ineffectiveness of the first incentives design:

- either prevention is not a field in which economic incentives are relevant to change GPs' practices, as underlined by the empirical literature on this topic (see Town *et al.* (2005), Christianson, Leatherman et Sutherland (2007)). GPs can consider that the delivery of preventive services is part of their job and that spending more time with patients to carry out preventive services is a duty (afterwards, 80,4% of GPs reported their intention to do it without any additional compensation). GPs' behaviour in the field of prevention would be mostly ruled by intrinsic motivations, more than economical considerations;
- or the type of incentives is not appropriate: a lump-sum payment or a real P4P program targeting specific actions of prevention might prove more effective.

If the first interpretation is the right one, it might mean that monetary incentives are definitely not the right instrument to induce GPs' behaviour change. If it is the second one which is correct, it would mean that it is the nature of the incentives design which is not appropriate.

Our study presents a second main result. Indeed, we show that GPs with a low level of work engagement (and thus intrinsic motivations) report to be less responsive to the introduction of economic incentives. Psychological well-being at work seems to interact with economic incentives and, in some cases, can alter their efficacy. Finally, we reverse the sense of the causality between extrinsic rewards and intrinsic motivations by highlighting the fact that **psychological well-being at work conditions the efficacy of economic incentives**. Improving people's work engagement (at least for GPs) could be a prerequisite to guarantee the efficacy of economic incentives. It is an interesting point at the moment when P4P is

generalizing in France for self-employed GPs, notably because we know on one hand that they are more likely to suffer from stress, anxiety disorders or depression and to commit suicide compared to the whole population (Dumesnil *et al.*, 2009) and on the other hand that burn-out syndrome is quite frequent in this profession (Truchot, 2001, 2002; 2004 ; Galam, 2007).

Nevertheless, these results have to be considered with caution because our study suffers from some limits. Firstly, our data are cross sectional data: it is not the same individuals that face the different scenarios of incentives: each of our three subsamples faced a different scenario of incentives. But, as our groups were randomly determined, we can exclude the existence of a “treatment effect” according to which the composition of the groups would have been endogenous to GPs’ individual characteristics and thus to their propensity to positively answer to the tested change.

Moreover, our data are declarative ones. As a consequence, we only measure willingnesses and not real behaviours. Though, not only this kind of data is widely used, notably in studies relying on contingent valuation method (see Diamond and Hausman (1994) for a complete review), but a review of Eccles *et al.* (2006) focusing on health professions tends to demonstrate that a non-negligible part of the variance in clinicians’ behaviour is explained by their reported willingnesses⁷ :

“In four of the five studies where a self-reported measure of behaviour was used, the measure of intention corresponded well to the measures of behaviour.” (Eccles *et al.*, 2006: p. 8)

Finally, it could be reproached to our study that our performance indicators are not really such an indicator. They are rather indicators of means or effort. Yet, although some studies highlighted that the link between the level of effort and the observed performance is not inevitably monotonically increasing (see Ariely *et al.* (2009) for a review), assuming the existence of a positive relation between, on the one hand, the improvement of GPs’ practice and, on the other hand, the time spend to deliver preventive services or to participate to a training session is not unfounded (Hugues, 1983 ; Wilson, 1991 ; Howie *et al.*, 1991 ;

⁷ *“The findings from this review of health care professionals are broadly consistent with those found in the non-health professional literature. Intention appears to be a valid proxy measure for behaviour for use in the development of implementation interventions.”* (Eccles *et al.*, 2006: p. 9).

Wiggers et Sanson-Fisher, 1997 ; Carr-Hill *et al.*, 1998 ; Freeman *et al.*, 2002 ; Bras et Duhamel, 2008a).

5- Conclusion

Taking into account in the economic theory the different motives of human behaviour, divided in the literature into intrinsic and extrinsic motivations, appeared to be essential to an increasing number of economists, notably since the works of Frey (1993), Kreps (1997) and Bénabou and Tirole (2003), because it enables to improve our understanding of human behaviour. This approach proposed some explanations to the numerous empirical results (mainly in experimental economics) highlighting the lack of efficacy of economic incentives and even their detrimental effect on individual's performance in certain field (the so-called COE). Although a wide literature, both empirical and theoretical, has attempted to understand in which circumstances economic incentives can fail to change people's behaviour, why they failed and what kind of incentives is likely to limit these counterproductive effects, few studies attempted to tackle this issue in the field of health professions (whereas they can be regarded as professions where intrinsic motivations are particularly relevant and thus can interact with economics incentives to affect agents' behaviour).

With this study, we aimed at proposing some new elements to enhance our understanding of the role played by intrinsic motivations on health supplier's behaviour. We showed through a kind of field experimental design that a crowding-out effect of monetary incentives on intrinsic motivations in the field of prevention is not proved. On the contrary, we highlighted that lump-sum payments are quite effective to encourage GPs' behavioral change in the expected sense (that we called crowding-in effect). We also pointed out that the least work engaged GPs are less responsive to monetary incentives. This last result brings us two comments:

- From the economic theory point of view, it reverses the standard analysis of the relation between intrinsic motivations and economic incentives. To date, most of existing studies focused on the impact of economic incentives on intrinsic motivations. We proposed here to analyze how intrinsic motivations, or more precisely psychological well-being at work, condition the efficacy of monetary compensation. Health dimension is traditionally not considered in the field of the economics of

incentives. We thought that further researches aiming at studying whether and how well-being at work can affect the efficacy of economic incentives are needed;

- In terms of public policy implications, we brought a new condition to the efficacy of monetary incentives in order to change people's behaviour. It seems that GPs' level of work engagement should be taken into account when implementing P4P programs. It notably implies that a policy aiming at improving psychosocial conditions at work, before or at the same time when implementing a policy relying on economic incentives, could improve the efficacy of such a policy.

Appendix

Appendix 1: Pearson's Chi-square Test for Independence between groups

- *Comparison for the question relative to the time devoted to prevention activities*

Prevention	group 1	group 2	Total
no	121	109	230
	52.61	47.39	100.00
	19.58	17.90	18.74
yes	497	500	997
	49.85	50.15	100.00
	80.42	82.10	81.26
Total	618	609	1,227
	50.37	49.63	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 0.5691 Pr = 0.451

Prevention	group 1	group 3	Total
no	121	83	204
	59.31	40.69	100.00
	19.58	13.63	16.63
yes	497	526	1,023
	48.58	51.42	100.00
	80.42	86.37	83.37
Total	618	609	1,227
	50.37	49.63	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 7.8349 Pr = 0.005

Prevention	group 2	group 3	Total
no	109	83	192
	56.77	43.23	100.00
	17.90	13.63	15.76
yes	500	526	1,026
	48.73	51.27	100.00
	82.10	86.37	84.24
Total	609	609	1,218
	50.00	50.00	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 4.1797 Pr = 0.041

Prevention	group 1	group 2	group 3	Total
no	121	109	83	313
	38.66	34.82	26.52	100.00
	19.58	17.90	13.63	17.05
yes	497	500	526	1,523
	32.63	32.83	34.54	100.00
	80.42	82.10	86.37	82.95
Total	618	609	609	1,836
	33.66	33.17	33.17	100.00
	100.00	100.00	100.00	100.00

Pearson $\chi^2(2) = 8.1457$ Pr = 0.017

- *Comparison for the question relative to the training session in TPE*

Training	group 1	group 2	Total
no	247	206	453
	54.53	45.47	100.00
	39.71	33.55	36.65
yes	375	408	783
	47.89	52.11	100.00
	60.29	66.45	63.35
Total	622	614	1,236
	50.32	49.68	100.00
	100.00	100.00	100.00

Pearson $\chi^2(1) = 5.0501$ Pr = 0.025

Training	group 1	group 3	Total
no	247	102	349
	70.77	29.23	100.00
	39.71	16.61	28.24
yes	375	512	887
	42.28	57.72	100.00
	60.29	83.39	71.76
Total	622	614	1,236
	50.32	49.68	100.00
	100.00	100.00	100.00

Pearson $\chi^2(1) = 81.3553$ Pr = 0.000

Training	group 2	group 3	Total
no	206	102	308
	66.88	33.12	100.00
	33.55	16.61	25.08
yes	408	512	920
	44.35	55.65	100.00
	66.45	83.39	74.92
Total	614	614	1,228
	50.00	50.00	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 46.8734 Pr = 0.000

Training	group 1	group 2	group 3	Total
no	247	206	102	555
	44.50	37.12	18.38	100.00
	39.71	33.55	16.61	30.00
yes	375	408	512	1,295
	28.96	31.50	39.54	100.00
	60.29	66.45	83.39	70.00
Total	622	614	614	1,850
	33.62	33.19	33.19	100.00
	100.00	100.00	100.00	100.00

Pearson chi2(2) = 84.0183 Pr = 0.000

Appendix 2: Sensitivity analyses depending on the split of our work engagement score

Work engagement score split at the 5% threshold

Training TPE N=1262	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Man	.1323824	.1561318	0.85	0.396	-.1736302	.438395
Age	-.0344657	.0089553	-3.85	0.000	-.0520177	-.0169136
Rural Practice	.0669372	.1533665	0.44	0.663	-.2336556	.36753
Scenario 2	.3318433	.1405819	2.36	0.018	.0563078	.6073789
Scenario 3	1.24668	.1794396	6.95	0.000	.8949845	1.598375
Intercept	2.207674	.4852307	4.55	0.000	1.256639	3.158709

Training TPE N=136	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Man	.8034419	.4979053	1.61	0.107	-.1724345	1.779318
Age	.0023633	.0272527	0.09	0.931	-.051051	.0557776
Rural practice	-.2315293	.4204454	-0.55	0.582	-1.055587	.5925284
Scenario 2	-.3918145	.4061869	-0.96	0.335	-1.187926	.4042972
Scenario 3	.2498514	.4897466	0.51	0.610	-.7100343	1.209737
Intercept	.3076206	1.491549	0.21	0.837	-2.615761	3.231002

Prob > chi2 = **0.0609**

Work engagement score split at the first quartile

Training TPE N=1062	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Man	.1675397	.1702817	0.98	0.325	-.1662063	.5012857
Age	-.0311079	.0097001	-3.21	0.001	-.0501198	-.012096
Rural Practice	.026312	.168831	0.16	0.876	-.3045906	.3572147
Scenario 2	.2812271	.1537188	1.83	0.067	-.0200563	.5825105
Scenario 3	1.289639	.1992844	6.47	0.000	.8990484	1.680229
Intercept	2.06652	.5241359	3.94	0.000	1.039233	3.093807

Training TPE N=336	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Man	.3039501	.3026015	1.00	0.315	-.2891379	.8970381
Age	-.0286703	.0173271	-1.65	0.098	-.0626307	.0052901
Rural Practice	.1139064	.2716398	0.42	0.675	-.4184979	.6463106
Scenario 2	.1574026	.2611351	0.60	0.547	-.3544129	.669218
Scenario 3	.6725762	.313227	2.15	0.032	.0586627	1.28649
Intercept	1.814449	.9497102	1.91	0.056	-.0469486	3.675847

Prob > chi2 = **0.8806**

Work engagement score split at the median

Training TPE N=718	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Man	.00183	.1982375	0.01	0.993	-.3867084	.3903684
Age	-.0205015	.011632	-1.76	0.078	-.0432998	.0022968
Rural Practice	-.0273482	.2051064	-0.13	0.894	-.4293494	.3746529
Scenario 2	.2457087	.188997	1.30	0.194	-.1247185	.616136
Scenario 3	1.149562	.2352683	4.89	0.000	.6884442	1.610679
Intercept	1.651155	.6306691	2.62	0.009	.4150665	2.887244

Training TPE N=680	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Man	.4350653	.2257038	1.93	0.054	-.0073059	.8774365
Age	-.0419377	.0123008	-3.41	0.001	-.0660468	-.0178286
Rural Practice	.1041891	.2009206	0.52	0.604	-.289608	.4979862
Scenario 2	.27858	.1866619	1.49	0.136	-.0872706	.6444305
Scenario 3	1.108058	.2385705	4.64	0.000	.6404689	1.575648
Intercept	2.434639	.6670135	3.65	0.000	1.127316	3.741961

Prob > chi2 = **0.9751**

Appendix 3: Pearson's Chi-square Test for Independence between groups depending on the level of work engagement

For the 90% of GPs the more engaged at work

- *Comparison between the three groups associated to the question relative to prevention*

Prevention	group 1	group 2	Total
no	85	80	165
	51.52	48.48	100.00
	19.10	17.06	18.05
yes	360	389	749
	48.06	51.94	100.00
	80.90	82.94	81.95
Total	445	469	914
	48.69	51.31	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 0.6446 Pr = 0.422

Prevention	group 1	group 3	Total
no	85	47	132
	64.39	35.61	100.00
	19.10	12.91	16.32
yes	360	317	677
	53.18	46.82	100.00
	80.90	87.09	83.68
Total	445	364	809
	55.01	44.99	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 5.6169 Pr = 0.018

Prevention	group 2	group 3	Total
no	80	47	127
	62.99	37.01	100.00
	17.06	12.91	15.25
yes	389	317	706
	55.10	44.90	100.00
	82.94	87.09	84.75
Total	469	364	833
	56.30	43.70	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 2.7256 Pr = 0.099

Prevention	group 1	group 2	group 3	Total
no	85 40.09 19.10	80 37.74 17.06	47 22.17 12.91	212 100.00 16.59
yes	360 33.77 80.90	389 36.49 82.94	317 29.74 87.09	1,066 100.00 83.41
Total	445 34.82 100.00	469 36.70 100.00	364 28.48 100.00	1,278 100.00 100.00

Pearson chi2(2) = 5.6606 Pr = 0.059

- *Comparison between the three groups associated to the question relative to the training session in TPE*

Training	group 1	group 2	Total
no	171 53.77 38.34	147 46.23 31.14	318 100.00 34.64
yes	275 45.83 61.66	325 54.17 68.86	600 100.00 65.36
Total	446 48.58 100.00	472 51.42 100.00	918 100.00 100.00

Pearson chi2(1) = 5.2458 Pr = 0.022

Training	group 1	group 3	Total
no	171 75.33 38.34	56 24.67 15.30	227 100.00 27.96
yes	275 47.01 61.66	310 52.99 84.70	585 100.00 72.04
Total	446 54.93 100.00	366 45.07 100.00	812 100.00 100.00

Pearson chi2(1) = 52.9865 Pr = 0.000

Training	group 2	group 3	Total
no	147	56	203
	72.41	27.59	100.00
	31.14	15.30	24.22
yes	325	310	635
	51.18	48.82	100.00
	68.86	84.70	75.78
Total	472	366	838
	56.32	43.68	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 28.1904 Pr = 0.000

Training	group 1	group 2	group 3	Total
no	171	147	56	374
	45.72	39.30	14.97	100.00
	38.34	31.14	15.30	29.13
yes	275	325	310	910
	30.22	35.71	34.07	100.00
	61.66	68.86	84.70	70.87
Total	446	472	366	1,284
	34.74	36.76	28.50	100.00
	100.00	100.00	100.00	100.00

Pearson chi2(2) = 53.1653 Pr = 0.000

For the 10% of GPs the less engaged at work

- *Comparison between the three groups associated to the question relative to prevention*

Prevention	group 1	group 2	Total
no	11	11	22
	50.00	50.00	100.00
	19.64	22.45	20.95
yes	45	38	83
	54.22	45.78	100.00
	80.36	77.55	79.05
Total	56	49	105
	53.33	46.67	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 0.1242 Pr = 0.724

Prevention	group 1	group 3	Total
no	11 64.71 19.64	6 35.29 19.35	17 100.00 19.54
yes	45 64.29 80.36	25 35.71 80.65	70 100.00 80.46
Total	56 64.37 100.00	31 35.63 100.00	87 100.00 100.00

Pearson chi2(1) = 0.0011 Pr = 0.974

Prevention	group 2	group 3	Total
no	11 64.71 22.45	6 35.29 19.35	17 100.00 21.25
yes	38 60.32 77.55	25 39.68 80.65	63 100.00 78.75
Total	49 61.25 100.00	31 38.75 100.00	80 100.00 100.00

Pearson chi2(1) = 0.1086 Pr = 0.742

Prevention	group 1	group 2	group 3	Total
no	11 39.29 19.64	11 39.29 22.45	6 21.43 19.35	28 100.00 20.59
yes	45 41.67 80.36	38 35.19 77.55	25 23.15 80.65	108 100.00 79.41
Total	56 41.18 100.00	49 36.03 100.00	31 22.79 100.00	136 100.00 100.00

Pearson chi2(2) = 0.1632 Pr = 0.922

- *Comparison between the three groups associated to the question relative to the training session in TPE*

Training	group 1	group 2	Total
no	20	23	43
	46.51	53.49	100.00
	35.71	36.00	40.57
yes	36	27	63
	57.14	42.86	100.00
	64.29	54.00	59.43
Total	56	50	106
	52.83	47.17	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 1.1591 Pr = 0.282

Training	group 1	group 3	Total
no	20	10	30
	66.67	33.33	100.00
	35.71	33.33	28.24
yes	36	20	887
	64.29	35.71	100.00
	64.29	66.67	71.76
Total	56	30	86
	65.12	34.88	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 0.0488 Pr = 0.825

Training	group 2	group 3	Total
no	23	10	33
	69.70	30.30	100.00
	46.00	33.33	41.25
yes	27	20	47
	57.45	42.55	100.00
	54.00	66.67	58.75
Total	50	30	80
	62.50	37.50	100.00
	100.00	100.00	100.00

Pearson chi2(1) = 1.2413 Pr = 0.265

Training	group 1	group 2	group 3	Total
no	20	23	10	53
	37.74	43.40	18.87	100.00
	35.71	46.00	33.33	38.97
yes	36	27	20	83
	43.37	32.53	24.10	100.00
	64.29	54.00	66.67	61.03
Total	56	50	30	136
	41.18	36.76	22.06	100.00
	100.00	100.00	100.00	100.00

Pearson $\chi^2(2) = 1.6893$ Pr = 0.430

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