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May 2010

Online at <https://mpra.ub.uni-muenchen.de/22878/>

MPRA Paper No. 22878, posted 25 May 2010 01:07 UTC

**Volunteers and conditions under which crowd-out effect could appear.
An empirical evidence of psychological self-determination theory**

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Abstract

The paper analyses if monetary rewards to continuative Italian volunteers decrease their intrinsic motivation undermining the satisfaction of psychological needs for autonomy and competence. It uses a Survey on Employment in the Social Care and Educational Services conducted by FIVOL-FEO in 1998. The paper shows that monetary rewards increase the satisfaction of psychological needs for autonomy and competence, but the satisfaction of psychological needs for autonomy and competence does not mediate between monetary rewards and intrinsic motivation.

Keywords: self-determination, self-evaluation, intrinsic motivation, monetary rewards
JEL classification: C13, C25, C31, D71, Z13

1. Introduction

In the literature on social sciences it is possible identifies two different branches that support the idea according to which monetary rewards may “*crowding out*” intrinsic motivation. The first stem is related to Titmuss and Upton’s books¹, in which the authors argue and support the observation that paying for blood undermines cherished social values. Therefore, the payment reduces or totally eliminates the willingness to donate blood. The second branch comes from empirical psychology. In particular, a group of cognitive social psychologists² identifies that, under particular conditions, monetary rewards undermine intrinsic motivation. This effect is termed “*the hidden cost of reward*” (Lepper and Green 1978; Deci 1975; Deci and Ryan 1985). Empirical psychology called Self-Determination Theory (SDT) considers intrinsically motivated activities those activities people do naturally and spontaneously when they feel free to follow their inner interest and to be maintained these activities require satisfaction of basic psychological needs. Basic psychological needs are defined as universal organismic necessities. SDT identifies three such needs - the needs for competence, autonomy and relatedness – that appear to be essential for ongoing psychological growth, integrity and well-being.

In economics, crowding-out effect is one of the most important anomalies, as it suggests the opposite of the most fundamental economic “law”, that raising monetary incentives reduces, rather that increases, supply. As a result, it is not advisable to use the price mechanism to elicit a higher supply and one would moreover rely on a quite different type of incentive, namely intrinsic motivation (Frey and Jegen 2001). The possibility that monetary rewards crowd-out intrinsic motivation, under identifiable conditions, is generally accepted at the theoretical level (see Bénabou and Tirole, 2003). At the empirical level, Frey and Jegen (2001) provide a review of a large number of studies offering empirical evidence in supporting the existence of crowding-out effect. In that study, the authors seem to follow SDT when they discuss the psychological conditions under which the crowd-out effect could appear: i) monetary rewards crowd-out intrinsic motivation if they undermine self-determination and self-evaluation.

¹ Titmuss (1970) and Upton (1973).

² See for a survey Pittman and Heller (1987), Lane (1991).

In the field of unpaid labour supply, several empirical studies point out on the relevance of intrinsic motivation in increasing voluntary work (Cappellari and Turati 2004; Carpenter and Myers 2007; Cappellari *et al.* 2007; Meier and Stutzer 2008; Bruno and Fiorillo 2009), but only few works emphasize the crowded-out function of monetary rewards (Frey and Götte 1999; Carpenter and Myers 2007; Fiorillo 2009). If intrinsic motivation depends on the application of monetary rewards, following SDT and Frey and Jegen's suggestions, an additional consideration becomes relevant: do monetary rewards influence intrinsic motivation of volunteers through the satisfaction of psychological needs for autonomy and competence? Put differently, is the satisfaction of psychological needs for autonomy and competence an important mediator between monetary rewards and intrinsic motivation of volunteers?

The aim of this paper is to analyse if monetary rewards to continuative Italian volunteers decrease their intrinsic motivation undermining the satisfaction of psychological needs for autonomy and competence. It uses a Survey on Employment in the Social Care and Educational Services conducted by FIVOL-FEO in 1998 (see Borzaga 2000; Borzaga and Musella 2004). Empirical findings show that monetary rewards increase the satisfaction of psychological needs for autonomy and competence, but the satisfaction of psychological needs for autonomy and competence does not mediate between monetary rewards and intrinsic motivation.

The following Sections 2 and 3 offer a short discussion on Self-Determination Theory and Frey and Jegen's suggestions. Section 4 shortly summarizes empirical studies on crowd-out effect in volunteering while section 5 provides empirical hypotheses to be tested. Section 6 presents the data and some descriptive statistics while Section 7 shows econometric findings. Section 8 draws conclusions.

2. Self-determination theory from a psychological' s point of view

Self-determination theory (SDT) was originally proposed by psychologists Deci and Ryan (1980, 1985, 1991) and it has now reached a high level of development. Its field is the investigation of people's inherent growth tendencies and basic psychological needs that are the basis for their self-motivation and personality integration, as well as for the conditions that foster those positive processes (Deci and Ryan 2000b).

SDT distinguishes between different types of motivation based on the different reasons or goals that give rise to action. Motivations, indeed, are conscious intentions to pursue activities. The basic distinction is between intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to do something because it is inherently interesting or enjoyable. A person is extrinsically motivated when is moved because of external prods, pressures and rewards (Deci and Ryan 2000c).

Intrinsic motivation exists in the relation between individuals and activities. People are intrinsically motivated for some activities and not for others, and everyone is intrinsically motivated for any particular task. Because intrinsic motivation exists in the nexus between a person and a task, some authors have defined intrinsic motivation in terms of the task being interesting while others have defined it in terms of the satisfactions a person gains from intrinsically motivated task engagement. Thus, the former affirms that intrinsically motivated activities are said to be ones for which the reward is in the activity itself. The latter asserts that intrinsically motivated activities are said to be ones that provides satisfaction of basic psychological needs. These two strands to the definition seem to lead some confusion about whether interest or psychological needs is the more critical defining characteristic of intrinsic motivation. Indeed, the two strands to the definition of intrinsic motivation are complementary. Intrinsically motivated activities are those that are freely engaged out of interest without the necessity of separable consequences and to be maintained they require satisfaction of basic psychological needs (Deci and Ryan 2000a).

Basic psychological needs are defined as universal organismic necessities rather than as acquired motives. SDT identifies three such needs - the needs for competence, autonomy and relatedness – that appear to be essential for ongoing psychological growth, integrity and well-being. Competence concerns the psychological need to experience confidence in one's abilities and understanding how to attain various external and internal outcomes. Autonomy refers to the extent to which the initiation and regulation of one's actions is determined by personal interests and meaningful values (i.e. by the self) versus being pressured and coerced by external contingencies. Finally, relatedness refers to the desire to feel connected to others – to love and care, and to be loved and cared for (Deci *et al.* 1991; Deci and Ryan 2000a; Houliort *et al.* 2002).

Focusing on the satisfaction of the basic psychological needs in the definition of intrinsic motivation allows prediction of the social circumstances and task characteristics that enhance versus diminish intrinsic motivation. Thus, intrinsic motivation will be facilitated by

conditions that conduce toward the satisfaction of psychological needs, whereas undermining of intrinsic motivation will result when conditions tend to thwart needs satisfaction (Deci and Ryan 2000a).

The sub-theory of SDT that specifies the factors in social contexts that produce variability in intrinsic motivation is Cognitive Evaluation Theory (CET) (Deci and Ryan 1985, 2000a).

CET consists of three basic propositions.

- (1) Intrinsically motivated behaviors are hypothesized to be based in human basic needs for autonomy and competence.
- (2) Social events are expected to influence intrinsic motivation by their impact on perceptions of autonomy and competence. Thus, tangible rewards, threats, deadlines, directives, pressured evaluations and imposed goals conduct people feel less like origins of their behaviour undermining autonomy and decreasing intrinsic motivation. In contrast, providing choice and acknowledgment of feelings can enhance people's confidence in their performance providing satisfaction of the need for autonomy. Furthermore, events such as positive feedback that signify effectance³ provide satisfaction of the need for competence, thus enhancing intrinsic motivation, whereas events such as negative feedback that convey ineffectance tend to thwart the need for competence and thus undermine intrinsic motivation⁴. CET specifies that intrinsic motivation will be enhanced if satisfaction of the need for autonomy is accompanied by the satisfaction of the need for competence.
- (3) The exact motivational impact of a social events, such as tangible rewards, depend on whether the recipient interprets the event as controlling versus informational. Controlling events are experienced as pressure to act, think of feel in particular way and interfere with feeling autonomous. Informational events provide performance feedback in a context of choice and bolster competence without endangering autonomy. However, in order for tangible rewards to be experienced as controlling, people would need to be engaging in the behavior for the rewards (Deci and Ryan 2000a, b, c; Deci *et al.* 2001; Houliort *et al.* 2002).

³ The phrase positive feedback that signify effectance refers to information that indicates to a person that he or she is competent at the target activity or information that lets the person know to become more competent at the activity (Ryan *et al.* 1983).

⁴ People must feel responsible for the competent performance in order for positive feedback to have positive effect on intrinsic motivation (Deci and Ryan 2000a).

3. From SDT to Frey and Jegen's suggestions

According to CET, tangible rewards, such as monetary rewards, decrease intrinsic motivation if they undermine the satisfaction of psychological needs for autonomy and competence. This occurs when monetary rewards are experienced by the recipients as controlling.

In economics, the possibility that monetary rewards crowd-out intrinsic motivation, under identifiable conditions, is generally accepted at the theoretical level (see Bénabou and Tirole 2003). At the empirical level, Frey and Jegen (2001) provide a review of a large number of studies offering empirical evidence in support of the existence of crowding-out effect. In that study, the authors seem to follow CET when they discuss the psychological conditions under which the crowd-out effect could appear. They consider the following processes (Frey and Jegen 2001, 594-595):

- 1) *Impaired self-determination.* When individuals perceive an external intervention as reducing their self-determination, intrinsic motivation is substituted by extrinsic control. Individuals, who are forced to behave in a specific way by outside intervention, feel overjustified if they maintain their intrinsic motivation.
- 2) *Impaired self-esteem.* When outside intervention carries the notion that the actor's motivation is not acknowledged, his or her intrinsic motivation is effectively rejected. The person affected feels that his or her involvement and competence is not appreciated, which debases its value. An intrinsically motivated person is deprived of the chance of displaying his or her own interest and involvement in an activity when someone else offers a reward. As a result of impaired self-esteem, individuals reduce effort.
- 3) External interventions crowd-out intrinsic motivation if the individuals affected perceive them to be controlling. In that case, both self-determination and self-esteem suffer, and the individuals react by reducing their intrinsic motivation in the activity controlled.

4. Volunteers and crowd-out effect

In the field of unpaid labour supply, several empirical studies point out on the relevance of intrinsic motivation in increasing voluntary work (Cappellari and Turati 2004; Carpenter and Myers 2007; Cappellari *et al.* 2007; Meier and Stutzer 2008; Bruno and Fiorillo 2009), but

only few works emphasize the crowded-out function of monetary rewards (Frey and Götte 1999; Carpenter and Myers 2007; Fiorillo 2009).

Frey and Götte (1999) estimate the impact of extrinsic monetary compensation on the supply of voluntary labour in Switzerland. They assume both intrinsically and extrinsically motivated individuals who volunteer in the political sector. In their theoretical model the choice of supplying voluntary work derives from a comparison of benefits and costs. Both are a function of the time spent in volunteering and of the direct reward. Two opposing effects are at work when the direct compensation to voluntary labour increases. On the one hand, direct reward reduces the opportunity costs of volunteering; on the other hand, it undermines the marginal utility of volunteering, so the net effect is theoretically undermined in sign. Empirical findings show that monetary compensation reduces voluntary labour supply (crowding-out effect according to authors).

Carpenter and Myers (2007), following the model of prosocial behavior developed by Bénabou and Tirole (2006), use a framework in which agent is motivated by altruistic preferences, extrinsic monetary incentives and reputational concerns. With data on voluntary firefighters in Vermont, authors find that altruism and concerns about reputation are positively associated with the decision to volunteer, while the positive effect of monetary incentives decline with reputational concerns, supporting the prediction that extrinsic incentives can crowd-out prosocial behaviour.

Fiorillo (2009) uses a theoretical framework to set out empirical hypotheses about the relative price effect and crowd-out effect on volunteer labour supply. Based on a survey on Employment in the Social Care and Educational Services conducted by the FIVOL-FEO, the author shows, controlling for endogenous bias, that monetary rewards, intrinsic motivation and interaction term between monetary rewards and intrinsic motivation play key roles in the real-life decision to volunteer. Furthermore, monetary rewards crowd-out intrinsic motivation because the crowd-out effect dominates the relative price effect and increasing monetary rewards reduces unpaid work.

5. Empirical hypotheses under which the crowd-out effect appears

To empirically analyse the conditions under which the crowd-out effect for volunteers could appear, following CET and Frey and Jegen (2001), I rearrange these conditions in the following way:

i) Monetary rewards crowd-out intrinsic motivation if the individual affected perceives them to be controlling. In that case, the satisfaction of psychological need for autonomy (self-determination) suffers, and the individual reacts by reducing his or her intrinsic motivation in the activity performed;

ii) Monetary rewards crowd-out intrinsic motivation if the individual affected feels that his or her competence isn't appreciated by the principal. In that case, the satisfaction of psychological need for competence (self-evaluation) is weakened and individual reduces his or her intrinsic motivation.

Thus, one intrinsic motivation is taken to depend on the application of monetary rewards, an additional consideration becomes relevant: do monetary rewards damage intrinsic motivation of volunteers undermining the psychological needs for autonomy and competence? Put differently, are psychological needs for autonomy and competence important mediators between monetary rewards and intrinsic motivation of volunteers?

Hypotheses. On the basis of conditions i) and ii), I suppose that monetary rewards decrease the satisfaction of psychological needs for autonomy and competence, and a decreasing satisfaction of psychological needs for autonomy and competence reduces intrinsic motivation.

Empirical implications. In the empirical analysis, the dataset provides proxies for intrinsic motivation and monetary rewards as well as proxies for the satisfaction of psychological needs for autonomy and competence. Consequently, empirical hypotheses are tested by: a) looking the sign of coefficient on monetary rewards in satisfaction of psychological needs for autonomy and competence equations; b) analysing the sign of coefficients on satisfaction of psychological needs for autonomy and competence in intrinsic motivation equation. All coefficients are expected negative and statistically significant,

6. Data set and descriptive statistics

The empirical analysis is based on a survey on Employment in the Social Care and Educational Services conducted by the FIVOL-FEO⁵ on public, for profit and non-profit organizations operating in the supply of a limited number of personal facilities: assistance and guardianship, nursing/rehabilitation, educational, cultural, recreational, school and school-to-

⁵ FIVOL: Fondazione Italiana per il Volontariato, the Italian Foundation for Voluntary service; FEO: Fondazione Europea Occupazione, Impresa e Solidarietà, the European Foundation, Employment, Enterprise and Solidarity.

work guidance, job-search assistance and others (for more details see Borzaga 2000). The survey was carried out in the first semester of 1998 in fifteen Italian provinces providing information on 730 voluntary workers. Among the mass of information utilized in the paper, there is data on individual characteristics, time spent in volunteering, reimbursements, intrinsic motivations, types of organizations, voluntary activities, voluntary experience, attitudes towards labour, volunteering satisfaction and so on. Appendix gives a table with the name and the definition of all variables used in the paper.

The survey asks individuals how often they offer voluntary work in the organization and how many hours they devote to voluntarism. Based on these questions, I use as sample of volunteers only regular unpaid labour (hours per week). Therefore, the sample includes 536 individuals.

One of the main advantages of FIVOL-FEO dataset is that it provides information on monetary rewards and motivations of volunteers. Thus, I form a dummy for direct rewards, assuming value 1 whether volunteer receives reimbursements for their activity and 0 otherwise. Moreover, in the absence of an economic consolidated literature, I define intrinsic motivation from three questions in which individual is asked whether he agrees that voluntary work is i) “a moral duty”; ii) “an opportunity to help others”; iii) “an opportunity to fulfil oneself”. I identify an intrinsic motivation dummy, which equals 1, for individual who agrees with all the previous questions. In so doing, I only consider people with a high intrinsic motivation. Table 1 displays that 23 percent of continuative volunteers receive monetary compensation⁶. With regard to intrinsic motivation, 22 percent of regular volunteers have a high intrinsic motivation.

Psychological variables derive from questions concerning volunteers satisfaction. In particular, I use two questions regarding decisional/functional autonomy and recognition for the activity carried out. I define *satisfaction of psychological need for autonomy* (SpnA) a dummy, which equals 1, if volunteer is satisfied with the decisional and functional autonomy enjoyed in the organization. Moreover, *satisfaction of psychological need for competence* (SpnC) is described as a dummy, which equals 1, if the volunteer is satisfied for the recognition by other individuals for the activity that he or she carries out. Table 1 shows that, on average, respectively, 60 and 72 percent of continuative volunteer are satisfied with decisional autonomy enjoyed in the organization and with the recognition by other individuals for the activity that he or she carries out.

⁶ I use monetary rewards, monetary compensation and reimbursements as synonyms.

Table 1 – Descriptive statistics

Continuative volunteer work			
Variable	Obs	Mean	St. Dev.
Monetary rewards	523	0.23	0.42
Intrinsic motivation	510	0.22	0.41
Satisfaction of psychological need for autonomy (SpnA)	488	0.60	0.49
Satisfaction of psychological need for competence (SpnC)	495	0.72	0.45
Female	536	0.63	0.48
Married	536	0.39	0.49
Widowed	536	0.04	0.19
Age 21-30	539	0.34	0.47
Age 31-40	539	0.16	0.37
Age 41-50	539	0.13	0.34
Age 51-60	539	0.15	0.36
Age 61+	539	0.16	0.37
Elementary school	536	0.05	0.23
Junior High school	536	0.18	0.39
University	536	0.20	0.40
Vocational qualification	525	0.14	0.34
Unemployed	528	0.12	0.32
Student	528	0.19	0.39
Housewife	528	0.14	0.35
Retired	528	0.21	0.40
Military/Objector	528	0.03	0.17
Other professional condition	528	0.04	0.19
Employed in social services	530	0.07	0.25
Volunteer experience	538	59.76	64.86
Coordination	534	0,11	0.32
Management	534	0.03	0.17
Service supply	534	0.65	0.48
Backing	534	0.24	0.43
Training	519	0.34	0.47
Public	539	0.24	0.43
Non-profit non religious	539	0.25	0.43
Public/Private	539	0.18	0.39
Family members volunteers	539	0.37	0.48
Friends	537	0.13	0.34
Civil service	537	0.05	0.21
Keep on volunteering	533	0.96	0.20
Work is a contribution to improve society	509	0.57	0.49

Table 2 – Correlations.

	Continuative volunteer labour			
	Monetary rewards	Intrinsic motivation	SpnA	SpnC
Monetary rewards	1.00			
Intrinsic motivation	0.03	1.00		
SpnA	0.13	0.13	1.00	
SpnC	0.10	0.07	0.45	1.00

The FIVOL-FEO survey provides information on two factors that are particularly important in voluntary labour supply, according to literature. People give unpaid work because of family connections. Furthermore, people volunteer primarily because they are asked to do so (Freeman, 1997, S163). Following literature, in this paper I use similar questions. Table 1 shows that 37 percent of continuative volunteers have family members who are volunteers, while only 13 percent of regular volunteers are asked to become a volunteer by their friends. Moreover, the FIVOL-FEO dataset has information on the type of voluntary activity performed in the organization. According to Freeman "*volunteers do very different things [...] Perhaps differences in the productivity of time spent in voluntary activities can help identify supply responsiveness in volunteering*" (Freeman, 1997, S158). Thus, using this information, I build four dummy variables, whose description is given in the appendix. Following Freeman (1997, S158), the aim is to understand whether the activity in which the volunteer offers its services – coordination, management, service supply and backing - is relevant in explaining his behaviour. Table 2 shows substantial differences among the types of volunteer activity. In particular, 65 percent of regular volunteers offer unpaid work in the provision of the service (in direct contact with recipients).

Table 1 highlights significant characteristics on age and education dummies. In particular, the dummy of a younger age provides most voluntary work. Moreover, unpaid work is increasing in education. Interestingly, on average, regular volunteers have a volunteer experience of 5 years, while 96 percent of them could continue the volunteer activity in the future.

Finally, simple correlations among intrinsic motivation, monetary rewards and the satisfaction of psychological needs for autonomy and competence are showed in table 2. It appears that all correlations are positive.

7. Empirical results

To perform an empirical test of hypotheses described in Section 5, I simultaneously estimate the equations for intrinsic motivation, satisfaction of psychological needs for autonomy and competence using a trivariate probit model that considers the correlation between the errors of the following three probit equations

$$I_{i,1}^* = \beta'X_{i,1} + \lambda SpnA_{i,1} + \theta SpnC_{i,1} + \varepsilon_{i,1}, \quad I_{i,1}^* = 1 \text{ if } I_{i,1}^* > 0 \quad (1)$$

$$SbnA_{i,2}^* = \beta'X_{i,2} + \pi_1 R_{i,2} + \varepsilon_{i,2}, \quad SpnA_{i,2}^* = 1 \text{ if } SpnA_{i,2}^* > 0 \quad (2)$$

$$SpnC_{i,3}^* = \beta'X_{i,3} + \pi_1 R_{i,3} + \varepsilon_{i,3}, \quad SpnC_{i,3}^* = 1 \text{ if } SpnC_{i,3}^* > 0 \quad (3)$$

where I_i is the dummy for intrinsic motivation, X_i the matrix of independent variables described in appendix plus three macro-regional dummies, associated with the vector of the β coefficients; $SpnA_i$, $SpnC_i$ and R_i are the dummies for the satisfaction of psychological needs for autonomy and competence and monetary rewards, while ε_i are the errors.

I jointly estimate the equations (1), (2) and (3) using a trivariate Probit model that considers the correlation in the unobservables of the three Probit equations, with error terms distributed as a trivariate normal distribution, each with mean of zero and a variance-covariance matrix with values equal to 1 on the main diagonal and a correlation of $\rho_{jk} = \rho_{kj}$.

The results of the estimates of (1), (2) and (3) for continuative volunteer labour are given in Table 3, which also shows the standard errors (in brackets) corrected for heteroskedasticity and the provincial clustering of residuals. According to the discussion in Section 5, the empirical implications are tested by looking the sign and the statistical significance of the coefficients on monetary rewards and on satisfaction of psychological needs for autonomy and competence. In particular, I look to the sign of coefficient on monetary rewards in the satisfaction of psychological needs for autonomy and competence equations, and analysing the sign of coefficients on satisfaction of psychological needs for autonomy and competence in intrinsic motivation equation.

"Likelihood Ratio (LR) test of PMV", the test of correlation among the error terms of the three probit equations, indicates that the null hypothesis of no correlation among the error terms can be rejected to the ordinary level of confidence. In other words, as one would expect,

Table 3 – Trivariate probit estimates for the sample of regular volunteers

Variable	Eq. 1		Eq. 2		Eq. 3	
	Intrinsic motivation		SpnA		SpnC	
Monetary rewards			0.415*	(0.228)	0.430**	(0.185)
SpnA	-0.812	(1.040)				
SpnC	0.162	(1.162)				
Female	-0.179	(0.141)	-0.111	(0.148)	0.063	(0.164)
Married	0.158	(0.248)	-0.058	(0.244)	0.293	(0.254)
Widowed	0.252	(0.463)	-0.566	(0.285)	-0.117	(0.474)
Age 21-30	0.092	(0.216)	-0.115	(0.438)	0.371	(0.370)
Age 31-40	-0.215	(0.216)	-0.157	(0.438)	0.311	(0.482)
Age 41-50	-0.395	(0.376)	-0.436	(0.462)	-0.097	(0.501)
Age 51-60	-0.596	(0.431)	-0.444	(0.567)	-0.081	(0.543)
Age 61+	0.015	(0.624)	0.567	(0.324)	0.285	(0.565)
Elementary school	0.156	(0.254)	0.334	(0.253)	0.166	(0.269)
Junior High school	0.011	(0.176)	0.256*	(0.141)	0.289***	(0.112)
University	-0.300	(0.193)	0.077	(0.168)	-0.070	(0.105)
Vocational qualification	-0.205	(0.260)	0.188	(0.216)	0.094	(0.243)
Unemployed	-0.012	(0.386)	-0.739***	(0.276)	-0.108	(0.345)
Student	-0.739**	(0.326)	-0.627**	(0.293)	-0.213	(0.292)
Housewife	-0.189	(0.273)	-0.506	(0.319)	-0.481	(0.367)
Retired	0.160	(0.481)	-0.695**	(0.285)	-0.001	(0.406)
Military/Objector	0.290	(0.641)	-1.046	(0.650)	-0.932	(0.602)
Other professional condition	-0.539	(0.393)	-0.345	(0.355)	-0.311	(0.612)
Employed in social services	0.184	(0.304)	0.046	(0.278)	-0.104	(0.381)
Volunteer experience	0.004*	(0.002)	0.001	(0.001)	0.002	(0.001)
Coordination	0.102	(0.240)	0.516***	(0.163)	0.043	(0.238)
Management	0.209	(0.480)	4.374***	(1.682)	0.267	(0.588)
Service supply	-0.060	(0.170)	0.210	(0.158)	0.112	(0.242)
Backing	-0.269	(0.175)	-0.067	(0.275)	-0.352	(0.218)
Training	0.089	(0.179)	0.251*	(0.137)	0.202	(0.159)
Public	-0.012	(0.464)	0.143	(0.208)	-0.406	(0.326)
Non-profit non-religious	0.300	(0.248)	0.216*	(0.114)	-0.342	(0.287)
Public/Private	0.296	(0.278)	0.278*	(0.158)	-0.260*	(0.149)
Family members volunteers	0.041	(0.218)	-0.070	(0.133)	-0.257**	(0.106)
Friends	0.016	(0.175)	0.038	(0.240)	-0.252	(0.240)
Civil service	-0.551	(0.362)	0.210	(0.630)	0.170	(0.499)
Keep on volunteering	0.098	(0.359)	0.475	(0.326)	0.333	(0.251)
Work is a contribution to improve society	0.798***	(0.165)	0.235	(0.168)	0.103	(0.142)
North-West	-0.150	(0.217)	-0.094	(0.132)	-0.329*	(0.176)
Middle	-0.089	(0.261)	-0.346***	(0.066)	-0.457***	(0.171)
South	0.548**	(0.245)	-0.180	(0.188)	-0.187	(0.275)
No. obs.			421			
Log likelihood			-610.955			
LLR test of PMV (χ^2)			75.804			
			(0.00)			

Note. The 3-equation model is estimated simultaneously using *Simulated Maximum Likelihood* (SML) methods. The estimator uses a Geweke-Hajivassiliou-Keane (GHK) with 23 random draws (Hajivassiliou and Ruud 1994). The estimates are coefficients. Standard errors (in brackets) are corrected for heteroskedasticity and the clustering of residuals at provincial level. The symbols ***, **, * denote significance at the 1, 5 and 10 percent levels respectively. Ho is $Cov(\varepsilon_{i,2}, \varepsilon_{i,1}) = Cov(\varepsilon_{i,3}, \varepsilon_{i,1}) = Cov(\varepsilon_{i,3}, \varepsilon_{i,2}) = 0$

intrinsic motivation, satisfaction of psychological need for autonomy and satisfaction of psychological need for competence are highly correlated. Consequently, the result is consistent with the conjecture.

Looking at the impact of monetary rewards on satisfaction of psychological needs for autonomy and competence equations (equations 2 and 3), it emerges that the probability a volunteer is satisfied with the decisional and functional autonomy enjoyed in the organization increases with direct rewards. The coefficient on monetary rewards in equation 2 is positive and significant at 10 percent level.

Furthermore, the probability that a volunteer feels that his or her involvement and competence is appreciated by others (included the principal) increases with direct rewards, too. The coefficient on monetary rewards in equation 3 is positive and significant at 5 percent level.

However, in equation 1, which analysis the determinants of intrinsic motivation, the coefficients on satisfaction of psychological needs for autonomy and competence variables are not significant. Stated differently, there are no correlations between intrinsic motivation and satisfaction of psychological needs for autonomy and competence. Thus, the hypotheses described in Section 5 are not verified.

A possible explanation of the absence of correlation between intrinsic motivation and monetary rewards through self-determination and self-evaluation may be due to the nature of monetary rewards. Ryan et al (1983) use the term *task-non-contingent reward* to indicate expected rewards that are given to people for participating in experimental session, independently of what they do in that session. They are rewarded simply for their presence, without respect to the completion or quality of task activity. This type of reward is essentially comparable to hourly payments in the real word. People are paid for being on the job rather for particular behaviors. According Ryan et al (1983), it appears that *task-non-contingent rewards* tend not to decrease intrinsic motivation because they do not create an instrumentality and are not experienced as controlling. In our sample monetary rewards are paid to volunteers to be on the unpaid work and without respect to the quality of task activity.

Therefore, the findings on satisfaction of psychological needs for autonomy and competence seem to indicate, on one hand, that monetary rewards do not create an instrumentality between voluntary activity and the reward and, on the other hand, monetary rewards provide some competence feedback, that is information that volunteers are competent on the activity. Stated differently, monetary rewards increase self-determination because

volunteers do not experience them as controller of their behaviour but as possible support of their sense of autonomy. Additionally, monetary rewards inform volunteers that the principal acknowledges their competence and this fact raises volunteers' self-evaluation. Thus, the controlling aspect of monetary rewards is not salient and intrinsic motivation does not decrease.

To summarize, the satisfaction of psychological needs for autonomy (self-determination) and competence (self-evaluation) does not mediate between monetary rewards and intrinsic motivation.

Finally, I look at the impact of other covariates. The probability of being intrinsically motivated (equation 1) increases in volunteer experience and in attitude towards work: volunteers who are in agreement with the question "work is a contribution to improve society" probably have higher intrinsic motivation. Furthermore, a positive correlation exists with living in the regions of southern Italy while a negative correlation emerges with the status of student. In equation 2, volunteer activities such coordination and management are positive determinant of satisfaction of psychological need for autonomy as well as the type of organization such as non profit non-religious and public/private. Moreover, being unemployment, retired and living in the regions of central Italy reduce the satisfaction of psychological need for autonomy. In equation 3, the satisfaction of psychological need for competence rises in junior high school and in public/private type of organization while it is decreasing in family members who volunteer as well as for volunteers who live in the regions of central and northern Italy.

8. Preliminary conclusions

This paper analyses if monetary rewards to continuative Italian volunteers decrease their intrinsic motivation undermining the satisfaction of psychological needs for autonomy and competence. It follows the Self-determination theory (SDT), originally proposed by psychologists Deci and Ryan, and, the Frey and Jegen's suggestions. The paper uses a Survey on Employment in the Social Care and Educational Services conducted by FIVOL-FEO in 1998. The study shows that monetary rewards increase the satisfaction of psychological needs for autonomy and competence, but the satisfaction of psychological needs for autonomy and competence does not mediate between monetary rewards and intrinsic motivation.

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Appendix

Variable	Description
<i>Dependent variables</i>	
Reimbursements	Dummy, 1 if the volunteer receives reimbursements for voluntary labour; 0 otherwise
Intrinsic motivation	Dummy, 1 if the volunteer is in agreement that voluntary work is i) “a moral duty”; ii) “an opportunity to help others”; iii) “an opportunity to fulfil oneself”
Satisfaction of psychological need for autonomy (SpnA)	Dummy, 1 if the volunteer is satisfied with the decisional and functional autonomy enjoyed in the organization
Satisfaction of psychological need for competence (SpnC)	Dummy, 1 if the volunteer is satisfied for the recognition by other individuals for the activity that he or she carries out
<i>Personal characteristics</i>	
Female	Dummy, 1 if female; 0 otherwise
Married	Dummy, 1 if married; 0 otherwise
Widowed	Dummy, 1 if widowed; 0 otherwise
Age 16-20	Dummy, 1 if age is between 16 and 20; 0 otherwise. Reference group
Age 21-30	Dummy, 1 if age is between 21 and 30; 0 otherwise
Age 31-40	Dummy, 1 if age is between 31 and 40; 0 otherwise.
Age 41-50	Dummy, 1 if age is between 41 and 50; 0 otherwise
Age 51-60	Dummy, 1 if age is between 51 and 60; 0 otherwise
Age 61+	Dummy, 1 if age is equal to 61 and above; 0 otherwise
Elementary school	Dummy, 1 if elementary school or no education; 0 otherwise
Junior High school	Dummy, 1 if compulsory education; 0 otherwise
High school	Dummy, 1 if high school graduates; 0 otherwise. Reference group
University	Dummy, 1 if university degree and doctorate; 0 otherwise
Vocational qualification	Dummy, 1 if specific qualification to perform welfare and educational services
Employed	Dummy, 1 if the volunteer is employed; 0 otherwise. Reference group
Unemployed	Dummy, 1 if the volunteer is unemployed; 0 otherwise
Student	Dummy, 1 if the volunteer is a student; 0 otherwise
Housewife	Dummy, 1 if the volunteer is housewife; 0 otherwise
Retired	Dummy, 1 if the volunteer is retired; 0 otherwise
Military/Objector	Dummy, 1 if the volunteer is in military service and/or a conscientious objector; 0 otherwise
Other professional condition	Dummy, 1 if the volunteer is in an other professional condition; 0 otherwise
Employed in social services	Dummy, 1 if the volunteer is employed in welfare and educational services; 0 otherwise
Volunteer experience	Number of months of volunteer experience
<i>Volunteer activities</i>	
Coordination	Dummy, 1 if the volunteer performs voluntary work in the activity of coordination/responsibility, 0 otherwise
Management	Dummy, 1 if the volunteer performs voluntary work in the activity of management, 0 otherwise
Service supply	Dummy, 1 if the volunteer performs voluntary work in the activity of service supply, 0 otherwise
Backing	Dummy, 1 if the volunteer performs voluntary work in the activity of support, 0 otherwise
Other activities	Reference group
<i>Types of organization</i>	
Public	Dummy, 1 if the type of organization is public; 0 otherwise
Non-profit religious	Dummy, 1 if the type of organization is private non-profit religious; 0 otherwise.. Reference group
Non-profit non-religious	Dummy, 1 if the type of organization is private non-profit non religious; 0 otherwise
Public/Private	Dummy, 1 if the type of organization is mixed (public / private); 0 otherwise

(Continue)

Variable	Description
<i>Other independent variables</i>	
Civil service	Dummy, 1 if the volunteer had civil service in the organization; 0 otherwise
Training	Dummy, 1 if the volunteer participated in educational experiences supported by the organization
Family members volunteers	Dummy, 1 if there are family members who are volunteers; 0 otherwise
Friends	Dummy, 1 if friends asked to individual to become volunteer; 0 otherwise
Keep on volunteering	Dummy, 1 if the volunteer intends to keep on volunteer work in future; 0 otherwise
<i>Attitude towards work</i>	
Work is a contribution to improve society	Dummy, 1 if the volunteer is in agreement that work is a contribution to improve society ; 0 otherwise